PORT OF LIVERPOOL.

ANNUAL REPORT

OF THE

MEDICAL OFFICER OF HEALTH

TO THE

PORT SANITARY AUTHORITY.

FOR THE YEAR

1920.

TOGETHER WITH OBSERVATIONS UP TO JUNE, 1921.

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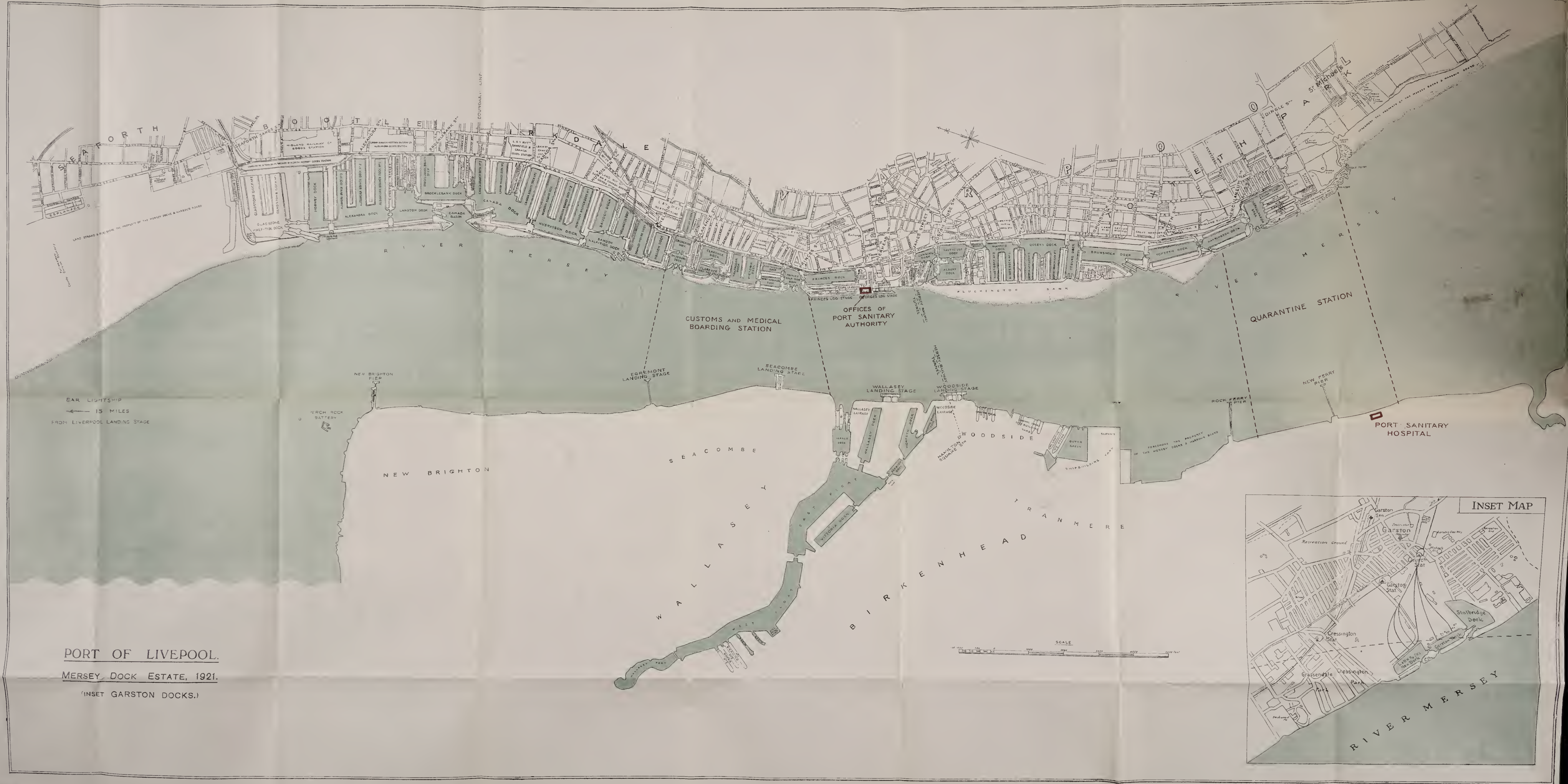

PORT OF LIVEPOOL.

MERSEY DOCK ESTATE, 1921.

(INSET GARSTON DOCKS.)

W A YEOMAN & Cº LITHOS. 62 DALE ST LIVERPOOL

PORT SANITARY AUTHORITY

OF

LIVERPOOL.

REPORT FOR THE YEAR 1920,

BY THE

MEDICAL OFFICER OF HEALTH.

In accordance with the duty imposed by the Local Government Board in the General Order, dated March 23rd, 1891, the following Report of the Operations of the Liverpool Port Sanitary Authority for the Year 1920 is herewith submitted.

The Report covers the work of the Authority during the year 1920, including references to the following:—

(*a*) Measures adopted under the Cholera, Plague and Yellow Fever, and Allied Orders of the Local Government Board, and under the Port Sanitary Authorities (Infectious Diseases) Regulations, 1920.

(*b*) The measures taken to reduce the number of rats on dock quays and on ships and to ascertain the existence of plague amongst any such rats.

(*c*) Action taken in regard to the Sanitation of Vessels.

(*d*) The inspection of imported foods under the Orders of the Local Government Board.

(*e*) The Medical Inspection of Aliens under the Aliens Order, 1919.

The trade of Liverpool is world-wide, as is indicated by the following list of ports from which vessels arrive in the Port Sanitary District.

Foreign.—Quebec, Montreal, Halifax, St. John's, New York, Boston, Philadelphia, Savannah, New Orleans, Galveston, Colon, Vera Cruz, West Indies, Demerara, Para, Manaos, Pernambuco, Bahia, Rio de Janeiro, Monte Video, Buenos Ayres, Rosario, Punta Arenas, Valparaiso, Callao, San Francisco, Vancouver, Stockholm, Copenhagen, Hamburg, Rotterdam, Antwerp, Havre, La Pallica, Bordeaux, Oporto, Lisbon, Cadiz, Barcelona, Valencia, Almeria, Bilbao, Marseilles, Genoa, Naples, Algiers, Tangier, Tripoli, Constantinople, Jaffa, Alexandria, Port Said, Las Palmas, Teneriffe, Dakar, Bathurst, Gambia, Freetown, Monrovia, Accra, Akassa, Seccondee, Calabar, Lagos, Fernando Po, Benguela, Cape Town, East London, Port Elizabeth, Durban, Zanzibar, Mombasa, Beira, Karachi, Bombay, Colombo, Calcutta, Rangoon, Bangkok, Saigon, Singapore, Sourabaya, Hong Kong, Hankow, Shanghai, Yokohama, Nagasaki, Vladivostock, Australian and New Zealand Ports.

British.—London, Southampton, Bristol, Swansea, Cardiff, Dublin, Cork, Waterford, Belfast, Larne, Glasgow, Aberdeen, Leith, Isle of Man, and Welsh Coast.

Almost every conceivable kind of cargo is carried by Liverpool ships, but the principal items of import and export are:—

Imports.—Corn, Grain, Cotton, Fish, Fruit, Hides, Leather, Meats, Oil, Rubber, Sugar, Tobacco, Wool.

Exports.—Carriages, Chemicals, Chinaware, Cotton Goods, Linen, Machinery, Oil, Rubber, Soap, Tobacco, Woollen Goods.

TABLE 1.

VALUE OF THE TOTAL IMPORTS AND EXPORTS OF MERCHANDISE AT THE PRINCIPAL PORTS OF THE UNITED KINGDOM FOR THE YEAR 1919.

	Imports.	Exports.	TOTAL.
	£	£	£
Liverpool	550,254,434	277,731,671	827,986,112
London	561,114,025	258,750,964	819,864,989
Hull	85,153,417	62,869,698	148,023,115
Manchester	98,308,318	3,373,092 45,209,335	146,890,745
Bristol	49,359,624	5,232,601	54,592,225
Newcastle ... ... (including North and South Shields)	12,372,453	37,612,269	49,984,722
Southampton	31,256,612	9,789,792	41,046,404
Glasgow	64,189,710	46,059,052	110,248,722
Belfast	12,244,731	1,554,467	13,799,198
	£	£	£
TOTAL—ENGLAND AND WALES ...	1,487,180,743	885,639,184	2,372,819,927
TOTAL—SCOTLAND	112,631,887	75,808,783	188,440,670
TOTAL—IRELAND	26,341,725	1,946,710	28,278,435
TOTAL—UNITED KINGDOM	1,626,156,212	963,384,677	2,589,540,889

TABLE 2.

AMOUNT OF SHIPPING ENTERING PORT SANITARY DISTRICT DURING THE YEAR 1920.

	Number.	Tonnage.	Number Inspected		Number reported to be defective.	Number of Orders issued.
			by Medical Officer of Health.	by Inspectors of Nuisances.		
*	(1)	(2)	(3)	(4)	(5)	(6)
Foreign—						
Steamers ...	2,612	7,623,943	346	2,298	701	—
Sailing ...	34	29,041	—	12	3	—
Fishing ...	—	—	—	—	—	—
Total—Foreign	2,646	7,652,984	346	2,310	704	—
Coastwise						
Steamers ..	9,587	3,442,496	—	1,091	66	—
Sailing ...	828	59,482	—	92	1	—
Fishing ...	—	—	—	—	—	—
Total—Coastwise	10,415	3,501,978	—	1,183	67	—

* Figures in columns 1 and 2 supplied by H.M. Collector of Customs for the Port.

Infectious Diseases.

The methods employed for the detection of infectious disease were given in detail in the Annual Report for 1919, but may be here briefly summarised as follows:—

Vessels arriving from the ports scheduled as plague-infected are boarded in the river by the Assistant Port Medical Officer. Information regarding infectious disease or sickness suspected to be infectious is obtained by the Medical Officer by either wireless message from the Master or Surgeon before the vessel arrives, telephonic message from Formby Lightship as the vessel comes up the Channel, or a memorandum from the Customs Officers of the Water Guard. Any vessels so notified are boarded immediately by the Medical Officer.

Cases of smallpox, cholera, yellow fever, or plague are removed in the ship's boat to the Port Sanitary Isolation Hospital. Cases of the more common infectious diseases, such as scarlet fever, measles, etc., are removed to the City Hospitals from the dock after the vessel has been berthed.

The City Ambulance Staff and the City Disinfecting Apparatus have been at the disposal of the Port Sanitary Authority during the year for the removal of patients to the City Hospitals, and the disinfection of large quantities of infected bedding, etc., from ships.

Plague.

During the year 1920 plague continued to be widely distributed throughout the world. India, China, Egypt, British East Africa, and South America suffered very severely. Siam and the Straits Settlements, Ceylon, Mesopotamia, Asia Minor, Turkey, Greece, Italy, France, Azores, Mexico, U.S. America, South Africa, all had a number of cases.

Amongst the ports scheduled as plague-infected during the year were Bombay, Calcutta, Karachi, Colombo, Rangoon, Guayaquil, Bahia, Ceara, Pernambuco, Maceio, Alexandria, and Salonika, and at the end of November, Constantinople, Smyrna, Beyrout and Mombasa were added to the list.

Vessels from these ports are boarded in the river by the Assistant Port Medical Officers.

In addition, a supplementary list is kept of all ports which have been infected with plague at any time during recent years. Ships arriving from these ports are visited within 24 hours of docking by the Port Sanitary Authority's Sanitary Inspectors, Rat Searchers and Rat Catchers, who, by enquiry, by thorough searching for sick and dead rats during discharge of cargo and by the trapping of rats for bacteriological examination, make every effort to ascertain whether any plague exists among the rats on board. This supplementary list of ports from which infected rats might be brought to this country includes the following:—

> Bassein, Moulmein, Saigon, Sourabaya, Bangkok, Singapore, New Orleans, Hong Kong, River Plate Ports, Syrian Ports, Dakar, Vera Cruz and Marseilles.

The history of epidemics of plague in this country proves that our present day freedom from plague is not, as so many people have grown to believe, just a question of a climate unsuitable to the spread of the disease, and the above formidable list of countries infected with plague during 1920 shows that it is the vigilance of Port Sanitary Authorities and the general Public Health Administration throughout the United Kingdom which makes Plague almost unknown in these islands to-day. In his introduction to a recently published report by Dr. R. Bruce Low on the "Progress and Diffusion of Plague, Cholera and Yellow Fever throughout the World, 1914-1917," Sir George Newman says:—" . . . Until the problems referred to have been solved it would be premature to regard plague as a disease which does not directly menace the inhabitants of Europe; it would be unwise to suggest that our knowledge of the disease and its control as a whole is sufficiently complete to permit a belief that the disease will speedily be reduced to a position of comparative impotence. And later in the same report Dr. R. Bruce Low says:—"Liverpool with its large amount of shipping with the East and with the ports of South America is particularly liable to the importation of infected rats, but the Port Sanitary Authority has so far met the danger with success, only a few instances having occurred in past years where the infection has succeeded in effecting a landing, but only for a short time, the vigorous measures hitherto employed having been always effectual in extinguishing the danger within a short period."

No cases of actual plague were landed in Liverpool during the year.

Two suspicious cases presenting buboes, the origin of which was obscure, were sent to the Port Isolation Hospital. In each case, pending more detailed examination of the patients in hospital and bacteriological examination of the contents of the buboes, the ship was treated as if plague-infected. Subsequently, however, both cases were proved not to be plague.

Of the 9,501 rats and 180 mice caught on ships and quays by the Port Sanitary Authority during the year, 6,633 rats and 160 mice were examined bacteriologically. Only three rats were found to be plague-infected. Of these one was trapped in November. Energetic measures were taken against rats in that area of the Dock Estate and no more infected rats were discovered. In response to the request of the Port Sanitary Authority the Mersey Docks and Harbour Board carried out the rat-proofing of a considerable area in the neighbourhood.

The other two infected rats were found dead close together at the end of December. Prompt measures were again taken and no more infected rats were found. It is now safe to say that the early detection of the infected rats and the energetic measures immediately taken were successful in preventing the spread of plague amongst the rat population of the docks.

The campaign against rats has been actively carried out during the year. In another part of this report an account is given of the measures used for the extermination of rats in the Port of Liverpool. But it may be mentioned here that though large numbers of rats may be destroyed in various ways it is only by the rat-proofing of buildings, etc., and by the removal of harbourages and nesting-places for rats that any permanent progress can be made in reducing the rat population. During the year in response to the requests of the Port Sanitary Authority a considerable number of existing huts, offices and canteens have been rendered rat-proof; all new premises have been rat-proofed during construction; great quantities of refuse have been promptly removed and ship's gear, chains, ropes, cargo-skids, etc., have been turned over and re-stowed on raised platforms.

All this work has been carried out in response to verbal or written requests from the Officers of the Port Sanitary Authority, and it has not so far been found necessary to serve any statutory notices under the Rats and Mice (Destruction) Act.

TABLE 3.

STATEMENT OF THE NUMBER OF VESSELS ARRIVING INFECTED OR SUSPECTED WITH PLAGUE AND FROM INFECTED PORTS, TOGETHER WITH PARTICULARS OF THE MEASURES OF RAT DESTRUCTION AND THE EFFECTS OF SUCH MEASURES DURING THE YEAR 1920.

Number of Vessels arriving in the Port Sanitary District.			Number of Vessels subjected to Measures of Rat Destruction.				Measures employed.	Effects of these Measures.	
Plague infected.	Plague suspected.	From infected Ports.	Plague infected.	Plague suspected.	From infected Ports.	Other Vessels.		On Rats—Number killed.	On Cargo.
—	*2	†346	—	2	307	259	Searching, Traying, and Trapping.	6,558	None (Vessels only fumigated when empty.
							Fumigation by SO_2	1,530	

*Not confirmed.

†Include 39 Manchester bound vessels.

TABLE 4.

Table showing the number of Rats obtained on ships and quays by the Authority's rat-catchers.

Year.	NUMBER OBTAINED			NUMBER					
				EXAMINED.			DESTROYED.		
	From Ships.	From Quays.	Total.	From Ships.	From Quays.	Total.	From Ships.	From Quays.	Total.
1913	7,943	958	8,901	3,280	938	4,218	4,663	20	4,683
1914	10,083	944	11,027	5,264	917	6,181	4,819	27	4,846
1915	9,400	1,256	10,656	6,204	1,234	7,438	3,196	22	3,218
1916	10,881	1,678	12,559	7,064	1,312	8,376	3,817	366	4,183
1917	9,174	1,551	10,725	6,379	1,457	7,836	2,795	94	2,889
1918	7,251	1,188	8,439	5,541	1,159	6,700	1,710	29	1,739
1919	8,971	1,336	10,307	6,023	1,287	7,310	2,948	49	2,997
1920	*8,088	1,593	9,681	5,276	1,517	6,793	2,812	76	2,888
Total......	71,791	10,504	82,295	45.031	9,821	54,852	26,760	683	27.443

* 1,530 of these were obtained after fumigation. 180 mice are included in these figures.

TABLE 5.

CITY AND PORT OF LIVERPOOL.

RETURN OF RATS CAUGHT, EXAMINED OR DESTROYED.

DATE.	CITY.				PORT.				CITY.		PORT.		TOTAL CAUGHT
1920.	Warehouses, Stores, &c.	Sewers.	Other Sources.	Total.	Ships.	Quays.	Other Sources.	Total.	Examined.	Destroyed.	Examined.	Destroyed.	(City and Port.)
January	698	—	1890	2,588	892	125	—	1,017	132	2,456	766	251	3,605
February	536	—	194	730	654	94	1	749	51	679	499	250	1,479
March	699	19	273	991	664	95	—	759	98	893	578	181	1,750
April	731	293	370	1,394	618	120	—	738	92	1,302	482	256	2,132
May	519	291	25	835	679	128	—	807	95	740	493	314	1,642
June	757	254	128	1,139	813	145	—	958	164	975	666	292	2,097
July	735	332	234	1,301	581	55	78	714	414	887	502	212	2,015
August	763	275	205	1,243	706	84	53	843	271	972	545	298	2,086
September	1,126	458	154	1,738	520	136	56	712	508	1,230	618	94	2,450
October	1,361	642	365	2,368	776	138	57	971	726	1,642	673	298	3,339
November	786	488	787	2,061	623	89	42	754	664	1,397	468	268	2,815
December	619	312	416	1,347	562	74	23	659	477	870	485	174	2,006
	9,330	3,364	5,041	17,735	8,088	1,283	310	9,681	*3,692	14,043	6,793	2,888	27,416

* Including 620 sent for other examination.

TABLE 6.

1920.

The combined returns of all rats and mice caught and destroyed by shipping firms employing their own rat-catchers, by rat-catching companies, and by the Public Health Authorities, are as follows:—

	Rats.	Mice.	Rats.	Mice.
PORT—				
On vessels	61,179	10		
On quays	1,423	170		
			62,602	180
CITY—				
In warehouses	9,257	73		
In sewers	8,392	13		
			17,649	86
		TOTAL ...	80,251	266

Rat Destruction.

The Officers of the Port Sanitary Authority wage a continuous war on the rats on board ships and in all parts of the Dock Estate. The objects constantly in view are:—

(1) The early detection of plague-infected rats.

(2) The prevention of the spread of plague if any infection is found.

(3) The reduction of the number of rats on ships and quays since the spread of plague amongst rats is directly proportional to the density of the rat population and the closeness of contact, in just the same way that communicable diseases amongst human beings spread most rapidly in crowded communities.

(4) The reduction of rats for economic reasons.

In order to detect plague all rats caught by the rat catchers of the Port Sanitary Authority and all dead rats found by the rat searchers are examined bacteriologically. The details of the method by which it is possible to trace the exact place where any infected or suspected rat was found are given on page 22 *et seq.*

In the work of reducing the numbers of the rat population great assistance is given by the private rat catchers and rat-catching companies employed by various shipping companies. If plague is discovered or suspected the rats caught by these various agencies are collected by the Port Sanitary Authority and sent for bacteriological examination. Measures are also taken to prevent rats getting ashore from ships, for, quite apart from the danger of plague, it is obvious that the campaign against rats which is being carried on so vigorously throughout the country will be useless if reinforcements are constantly being allowed to land from ships coming from abroad.

The measures used by the Port Sanitary Authority against rats are as follows:—

RAT-PROOFING.

No measures of rat destruction, such as trapping, poisoning, etc., can be really effective against a rat population which has every facility for nesting and breeding in safety and an ample food supply easily available. All types of buildings on the docks, but particularly those used for the storage of foodstuffs should be made impervious to rats. Present the rats with an acute housing problem and a scarcity of food, and not only will they be unable to breed, but also trapping and poisoning may be used against them with success, for a hungry rat is much more likely to be attracted by poisoned bait or the bait in a trap than one which has a plentiful supply of food obtainable without trouble and without risk.

On the Liverpool Docks the great majority of the sheds and warehouses are rat-proof constructions. Some of the older areas are not so satisfactory and pending reconstruction it is only possible to temporise, for the rat-proofing of old buildings is a very expensive matter. The Port Sanitary Authority give special attention to these areas and progress is steadily being made towards constructional rat-proofing throughout the dock estate. But it cannot be too strongly emphasised that though a shed may be of rat-proof construction care must be taken that rat harbourages do not exist within the shed. Huts and offices inside the sheds must be raised 18in. to 2ft. clear of the ground and the space beneath kept clean. Accumulation of dunnage must be avoided particularly in the corners of sheds where they may remain for months without being disturbed. Ropes, working tackle, cargo skids and ship's gear of all sorts must be stored clear of the ground and turned over at frequent intervals, otherwise excellent nesting places and harbourage for rats are provided. Such places as meter-boxes, the flat tops of Customs lock-ups, etc., must be kept clear of refuse.

The Officers of the Port Sanitary Authority are constantly inspecting the sheds and the dock quays and drawing attention to any conditions which afford harbourage for rats. As the majority of the sheds on the Dock Estate are transit sheds it is not often that cargo remains long enough to give trouble in this direction.

RAT DESTRUCTION.

The Port Sanitary Authority employs five rat catchers who devote their whole time to this work. In addition many of the Shipping Companies employ their own rat catchers or rat-catching companies. The rat is an intelligent and crafty animal, consequently if such measures as trapping and poisoning are to meet with success they must be undertaken by men who understand rats and their ways. The mere placing of a wire cage in front of a rat hole and leaving it there for weeks is worse than useless, for it simply serves as an object lesson to rats to avoid traps. In the same way the indiscriminate use of poison laid in exactly the same way day after day is sheer waste of money for the rats quickly learn that it is fatal to eat such food and carefully avoid it.

The methods of rat destruction used by the Port Sanitary Authority are:—

TRAPPING.

Wire cage-traps of the French type are used on both ships and quays. The trap is baited with something which is not only attractive to the rats, but which is likely to prove a welcome change of diet for them. After careful study of the rat runs the cage is set in the most suitable place and in the line of the run. It is then covered with canvas, sacking or any material which is handy, only the ends being left open. Clever concealment is of the greatest importance in preventing the rats from becoming trap-shy. Unfortunately cages being easy to set and requiring little looking after are frequently placed by amateurs with no effort at concealment. Consequently the rats quickly learn to mistrust all wire contrivances. All the traps set by the rat catchers of the Port Sanitary Authority are visited daily, the rats collected and the traps reset.

SNAP-TRAPS.

Snap or break-back traps are used in sheds, but are unsuitable for use on ships as the vibration consequent on working cargo will set these traps off, and they will be found next day sprung and the bait eaten, but without rats. When snap-traps are used they are always placed across the run-way. If they are placed with their long axes in the line of the run-way a rat approaching from the hinge end will set off the trap, and get off with nothing more than a fright. A snap-trap will only catch one rat, whereas a cage will catch several, but snap-traps are much cheaper and so can be used in greater numbers. Snap-traps have the disadvantage that they kill the rat, and when it becomes cold the fleas will leave the body. When plague infection is suspected it is advisable to keep the fleas on the rat till both can be killed together. All rats caught by the Port Sanitary Authority before being sent for bacteriological examination are soaked in paraffin for ten minutes to kill the fleas.

Bird-Lime Trays.

The tray is made of sheet metal turned up at the edges all round, making a container not more than half an inch deep. The shape and superficial area of the trays may vary, depending on the situation for which they are intended, but the usual sizes are 10in. by 20in., and 18in. by 18in. The tray is warmed and also the birdlime until the latter is about the consistency of syrup when it is poured on to the warmed tray and carefully spread over the whole surface by means of a paperhanger's stripping knife. A tray so prepared will last about a month, but it is necessary frequently to renew the surface by turning the birdlime over. The range of employment of trays is somewhat limited as they are not suitable for out-door work unless the weather is warm enough to keep the surface sticky. They should not be placed where a current of cold air can blow across them or where the rats will run through mud or oil before coming on to the tray. They are useless in very dusty situations as a film is formed on the surface over which the rat may pass with impunity. Finally, bird-lime trays must be placed out of the way of birds and domestic animals. Some attractive bait is usually placed in the centre of the tray, but must not be submerged. Baiting is not absolutely necessary, as reliance may be placed on the rat accidentally getting on to the tray while using his customary run. To this end trays are usually placed in the line of run-ways and are particularly useful along ledges and beams as they are wide enough to block the way in its full width.

Poisoning.

Poisoning is not used to any great extent by the Port Sanitary Authority as the main object is to obtain rats for bacteriological examination and rats found dead are regarded with suspicion until the absence of plague infection is reported by the Bacteriologist. But from time to time when buildings are emptied of food supplies, prior to demolition or reconstruction, poisoned bait is laid in order to destroy the rats before they migrate to other parts of the docks. Also when any area is found to be badly infested with rats poisoning is sometimes used, but only after a sufficient number of rats have been caught and examined bacteriologically to make it certain that no plague infection exists and that dead rats found subsequently can be safely regarded as having died of poison and not of plague. Poisoning is always entrusted to men who take care that there is no risk of contaminating human food supplies and who also understand how to make the poisoned bait attractive to rats and how to change the manner in which the poison is presented as soon as ever the rats become suspicious. It cannot be too strongly emphasised that for any methods of rat destruction to be successful they must be in the hands of men who understand rats, who appreciate their intelligence and cunning and who can change their tactics as soon as the enemy's suspicions have been aroused.

VIRUS.

Virus is not used by the Port Sanitary Authority.

FUMIGATION OF RAT-RUNS.

In a few cases where numerous rat-runs have been found in soft ground the fumigation of the runs has been attempted by SO_2, pumped from a small portable Clayton machine. In no case has this been successful in causing the rats to bolt from the holes left open. Whether the rats have succeeded in escaping by undiscovered runs or whether they have been killed in their holes by the fumes is not certain. But after fumigation the holes have been carefully watched for several months and no evidence of the return of the rats to their old haunts has been discovered.

Rat Guards.

Whatever precautions are taken it is an extremely difficult matter to prevent rats passing from the ship to the shore. At present circular metal rimless ratguards, three feet in diameter, are used on the mooring ropes of ships in this Port. Experiment has shewn that such ratguards, if properly adjusted, present an obstacle which a rat will not tackle unless pressed, and this method is undoubtedly superior to parcelling the ropes and smearing with Stockholm tar, for rats have been observed to run over this after only a moment's hesitation, even when the tar was quite fresh. The difficulty with other sticky substances applied to ropes is that with the dust which quickly adheres, and the exposure to wind and rain, a pellicle rapidly forms on the surface over which the rat can travel without inconvenience. Rats dislike the smell of tar, but the mere smell will not stop them if they are frightened or hungry. Unfortunately, the maintenance of ratguards in proper adjustment is extremely difficult, for the force of the wind, the rise and fall of the ship in the dock during discharge or loading of cargo, and the chafing of adjacent ropes, all throw them out of position, or even destroy them. Moreover, when a number of ropes run from a big ship to the same bollard on the quay, it is impossible to fix ratguards satisfactorily. One steamship line in Liverpool employs a man whose whole time is devoted to keeping the ratguards on the mooring ropes of their ships properly adjusted. Even if mooring ropes are protected, there are other routes for rats to come ashore. The guarding of the gangway presents great difficulties; there are ropes down to fenders up and down which rats can climb, and in the case of a ship with little freeboard rats may easily jump straight ashore from the ship.

Fumigation of Ships.

All the above-mentioned difficulties point to the importance of fumigation to destroy the rats on board the ship, and to leave behind a smell which will discourage rats from going on board afterwards. In Liverpool fumigation of vessels for rat destruction is carried out

(*a*) when there is any suspicion of plague infection among the rats on board;

(*b*) to comply with the requirements of certain foreign governments who demand a certificate of fumigation;*

(*c*) whenever the investigations of the rat-searchers and rat-catchers of the Port Sanitary Authority indicate that a vessel is a "rat infested" ship.

---

* See Appendix.

A system of regular fumigation at intervals of (say) six months would be of the greatest value as an anti-rat measure. The difficulties in face of this are the cost of the fumigation and the delay to the ship necessitated by the proceeding.

In Liverpool, ships are only fumigated after the discharge of cargo. It is most important to see that quantities of dunnage are not left at the bottom and in the corners of the holds before fumigation is commenced, because the sulphur dioxide may not penetrate through all parts of such accumulations and rats may take refuge there and survive. The sulphur is burnt in iron pots which stand in trays of water as a precaution against fire. Two and a half pounds of sulphur are burnt per 1,000 cubic feet of space, giving a concentration of 3% of SO_2; the hatches are closed for at least twelve hours. The pots are disposed so as to assure a sufficient concentration of the gas in all parts of the holds. If a large quantity of sulphur is placed in one pot, not only is proper diffusion delayed, but also the sulphur may not burn through completely, and there may be a wide difference between the actual and the calculated concentration of SO_2. It is therefore desirable to have the sulphur in small quantities in as many receptacles as possible consistent with the operator being able to light all the pots and escape from the hold before the fumes become too strong. In any case not more than ten pounds of sulphur should be allowed in any one pot. After the hatches are opened and the fumes have dispersed sufficiently, rat-searchers proceed below and collect all the dead rats which are subsequently destroyed in the ship's furnace.

In the case of oil-fired vessels it has been considered unsafe to burn sulphur in the holds, therefore cylinders of liquid SO_2 have been thrown into the holds and 'tween decks from the hatches. Although efforts are made to distribute the cylinders as widely as possible when they are thrown down, there is reason to believe that the gas does not become as thoroughly diffused as when sulphur is burned in open pots. This is probably due to the absence of the convection currents caused by the heat of the burning sulphur. Further, cylinders of SO_2 become badly dinted by the force with which they fall in the bottom of the holds, and this dinting may interfere with the escape of the gas. It is considerably more expensive to use liquid SO_2 than to burn sulphur, though some expense is saved in labour, there being no weighing of sulphur, preparing and placing of pots beforehand, and collecting and cleaning of pots after the fumigation is over.

Detection of Rat Plague.

Administrative Methods in the Port of Liverpool.

The staff of the Liverpool Port Sanitary Authority includes:—

7 Sanitary Inspectors,
5 Rat Searchers,
5 Rat Catchers.

SANITARY INSPECTORS.

In addition to dealing with the general sanitary conditions in the Port, the Sanitary Inspectors make careful enquiries when visiting ships, into the prevalence of rats on board and as to whether any sick or dead rats have been seen or reported during the voyage. They also devote one and a half days per week specially to inspecting their particular area of the Dock Estate for rat harbourages; evidence of rats on quays and in warehouses and to ascertain whether the buildings are reasonably rat-proof or otherwise. In addition to this one and a half days per week they take note of the conditions prevailing as they go to and from their work on the ships.

RAT SEARCHERS.

These men devote their whole time to searching ships and quays for sick and dead rats. Under ordinary circumstances four are employed in ships and one on dock quays.

All ships arriving from ports where plague has been prevalent at any time during recent years and which can possibly be regarded as centres of dissemination of plague are visited the day after arrival, and a preliminary search made as far as possible. They are subsequently searched once or twice during the discharge of cargo and once when the holds are empty. The rat searcher on the dock quays works systematically from one end of the docks to the other.

RAT CATCHERS.

3 are employed on ships;
2 are employed on quays.

As regards ships, chief attention is paid to those from plague-infected ports. The work of the rat catchers is, of course, guided by the reports from the Sanitary Inspectors and from the Rat Searchers and on any suspicion of plague both Rat Searchers and Rat Catchers are at once concentrated on the suspected area, and intensive measures of rat extermination put into operation.

Sanitary Inspectors, Rat Searchers and Rat Catchers each have their own note-books in which they enter daily the work done, underlining any special points. These books are read over by the Assistant Port Medical Officers who are thus kept informed of the conditions existing.

All rats caught by the Port Sanitary Authority's Rat Catchers and all sick or dead rats found are sent to the City Bacteriologist for examination, and in cases of doubt are also submitted to the City Analyst for examination for poison.

In case of any rat being found to be plague-infected, it is obviously of the utmost importance to be able to trace exactly where and when that rat was caught. The method of keeping track of the rats is as follows:—

1. The Rat Catcher has a linen bag for each trap, and all the rats caught in any one trap are placed in this bag.

2. The rats are brought to the office and soaked in paraffin for ten minutes to kill the fleas.

3. A label, bearing a specific number, is fixed to the leg of each rat. Rats belonging to one batch, i.e., caught or found in the same place all bear the same number on the leg label and are then all enclosed in a muslin bag round the neck of which is tied a label bearing the same number as the leg labels on the rats.

4. The Rat Catcher then fills in a record of all his catch for the day, giving number of bag—where rats were obtained—how

obtained (i.e., whether cage, snap-trap, bird-lime tray, or found dead)—number of rats and type.

5. The particulars from all these records of the five rat catchers are then entered in a book "*Record of Rats caught.*"

6. A complete list of rats caught in the day, giving number in each batch and where caught, is then prepared in a book of receipt forms of which a carbon copy is made.

7. The bags are collected and conveyed together with the Receipt Book to the City Bacteriologist who signs the forms, tears out and retains the counterfoil and returns the Receipt Book to the Port Sanitary Office.

The subsequent report of the Bacteriologist of any rat infected or suspected to be infected with plague, gives the number of the label on the leg of the rats. On reference to the book "Records of Rats Caught," the place where the rat was caught and the date of catching can be at once obtained. Further, by reference to the books the particular rat catcher who obtained the rat can be identified.

Note.—If a rat is found sick or dead, the particular place of finding is noted in the books (i.e., the exact position in the ship or on the dock quays).

When rats are found sick or dead or in any suspicious circumstances they are always sent to the Bacteriologist in a separate bag from any rats caught alive, and on the label on the neck of such bag is placed an adhesive label marked in large red letters, "Suspected Rats."

Rats are also caught by private agencies and by rat-catchers employed by the various shipping companies, who submit all sick or dead rats to the Port Sanitary Authority to be forwarded to the City Bacteriologist. The importance of this latter step is emphasised in a circular which is widely distributed amongst shipmasters and other officers (including stewards), dock masters, wharfingers, warehouse keepers, rat catchers, etc.

The shipping companies also submit to the Port Sanitary Authority fortnightly a form giving the total number of rats caught by the agencies they employ.

Cholera.

Though cholera advanced from the East as far West as Turkey and Southern Russia, no cases were landed at Liverpool or occurred on Liverpool-bound vessels.

Typhus Fever.

The continent of Europe suffered severely from Typhus during the year, particularly Russia and Poland, and though cases also occurred in Belfast, Dublin, Queenstown, Dundee and Glasgow, no cases occurred at Liverpool or on Liverpool-bound vessels, in spite of the great number of transmigrants from Central Europe passing through the Port.

Smallpox.

Only one case of Smallpox was brought into the Port of Liverpool on shipboard during the year.

Three men landing at other ports came by train to Liverpool in the incubation stage of the disease.

Two cases suspected to be Smallpox, but subsequently proving to be Chicken-pox, were landed from ships in this Port and taken to the Port Sanitary Hospital. In these latter cases, pending definite diagnosis, vaccination was offered and as a rule carried out in the case of all contacts, their names and addresses were taken and the infected quarters disinfected.

The s.s. " Manzanares " arrived in Liverpool on September 5th, 1920, from Kingston, Jamaica. Joseph Johnson, a negro fireman, was found to be suffering from Smallpox. He was removed in the Ship's boat to the Port Sanitary Hospital. Sixty-two members of the crew and ten passengers were vaccinated by the Port Medical Officer. No further cases occurred.

The s.s. "Ravenrock" arrived in Liverpool from India, Mauritius, South Africa and Las Palmas on July 19th. Abdul Ali, a native fireman, who had been ill since July 9th, was taken to the Port Sanitary Hospital as suspected Smallpox. The Captain, two officers, and the native crew had been vaccinated by the Medical Officer at Las Palmas, but the rest of the European crew refused vaccination there. At Liverpool the whole crew were inspected, those of the native crew whose vaccination at Las Palmas was not taking were re-vaccinated and those of the European crew who could not produce evidence of recent vaccination were re-vaccinated with the exception of six who persisted in their refusal. The case subsequently proved to be Chicken-pox.

The s.s. "Macharda" was lying at Vittoria Wharf, Birkenhead, having arrived from Glasgow on October 19th, 1920. On the 25th October, 1920, notification was received from the doctor attending the crew that Hassein Bux, a native seaman, was suffering from Smallpox. The patient was removed to the Port Sanitary Hospital, and all available members of the crew were vaccinated, 20 Europeans and 76 natives. The case subsequently proved to be Chicken-pox.

Anthrax.

As in previous years, isolated cases of Anthrax occurred during 1920, chiefly amongst those employed in the handling of various animal products, such as hides, skins, and wool. There were only four cases reported during the year, a much lower figure than recorded for many years. Although no cases were traced to the use of infected shaving brushes, nevertheless, it was considered desirable to continue the bacteriological examination of shaving brushes purchased in the city regularly. Two cases were reported as due to East India wool—one of these patients died. (See next page.)

CASES OF ANTHRAX REPORTED DURING THE YEAR 1920 IN CONNECTION WITH THE HANDLING OF ANIMAL & OTHER PRODUCTS.

Date, 1920.	Sex.	Occupation.	Suspected Material.	Origin of Material.	Situation of Pustule.	Severity and Result.
May 5......	M.	Dock Labourer	Hides..................	E. African Ports ...	Back of neck	Pustule excision and recovery.
June 12......	F.	Wool Sorter	Wool	Indian Ports	Right side of neck	Death.
June 20......	M.	Dock Labourer	Wool, Hides and Goatskins	Indian Ports	Left eyebrow	Recovery.
Nov. 5......	M.	Meat Salesman	Meat ? (not definately traced)	—	Left finger	Pustule excision and recovery.

The Prevention of Venereal Diseases.

Those who have devoted attention to the preservation of the public health know that it is advantageous to bring known carriers of infectious disease under control, and to prevent them from spreading those diseases.

The application of this principle has been followed by a reduction to vanishing point of many of the infectious diseases formerly rife in Liverpool, whilst the remainder have been diminished to less than one half. The actual saving of life, the diminution of suffering, and the lessening of cost which have resulted can be appreciated by reference to the appropriate sections of this Report.

The provision and application of the measures necessary to effect this control have not been simple; on the contrary, many and great difficulties had to be overcome in the process.

For reasons presently to be alluded to, Venereal Diseases remain outside these beneficent measures of control,* notwithstanding that these diseases are contagious, infectious, communicable, and dangerous to the public health, far beyond the sense in which Scarlet Fever and Smallpox are, since they are transmissible to offspring, with equally damaging virulence. Venereal Diseases indeed are recognised by the medical profession as one of the leading causes, if not (as Sir William Osler considered) the leading cause of death. They are a prolific cause of sterility, and of abortion, of congenital mal-formation and still-birth (*a*), lunacy (*b*), and blindness (*c*). These admitted facts explain the anxiety in regard to them which is felt by those interested in promoting public health, and justify a survey of the steps taken to meet the evil, and of the measures of success which have attended them.

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* Briefly, they include the provisions of the Public Health Acts and numerous Local Acts, designed to meet the exceptional necessities of Liverpool.

a Approximately 15% of still-born infants examined by the City Bacteriologist were found to be infected with syphilis.

b Upwards of 15% of admissions to asylums in U.S.A. were syphilitic. Probably the same holds in this country. (See International Journal of Public Health, Vol. II, published by the Red Cross Society, Geneva).

c Dr. Bishop Harman, in an examination of a large number of London school children in the London County Council Schools for the Blind, found 36% to be blind as the result of Ophthalmia Neonatorum, and 17% as the result of congenital syphilis.

Without going into unnecessary detail, it may be stated that the Scheme at present in vogue in Liverpool had its foundation in the Report of the Royal Commission on Venereal Diseases, which, after some years of deliberation, advised the provision of free treatment for sufferers who were willing to accept it, and facilities for accuracy of diagnosis in all cases; the suppression of quackery was also advised.

These recommendations have been accepted by the Ministry of Health and measures have been in active operation since 1917.

The only step in the Scheme likely to prove effective is that relating to treatment. Unfortunately, however, this is fettered by limitations to such as choose to avail themselves of it, and for such periods as the recipients think appropriate; it may be discontinued at will, whatever the degree of infectiousness, or whatever the occupation of the infected person may be. The narrowness of the limitation of usefulness will at once be realised by applying the same principle in the case of smallpox.

It is clear that in order that full benefit may be obtained from the free treatment which is provided, the patient should in the public interest continue treatment until he is free from infection, and in his own interests until he is cured.

It is noteworthy that the reasons assigned for objecting to legislative control of Venereal Disease are precisely those which were raised in bygone years to the legislative control of ordinary infections, Scarlet Fever, Smallpox, etc.

In advising appropriate educational propaganda, the Royal Commission remark that in this propaganda "a high standard of efficiency and tact is indispensable, and the guidance of medical practitioners must be enlisted." Indiscriminate addresses to young persons of both sexes, given by persons unfamiliar with the subject, whose sole qualification is their zeal, will do more harm than good. Happily, large sections of the youthful community are removed, not only by their youth and the social protection afforded them, but also by moral and religious upbringing, from the degrading association which these diseases, and there are many who think that haphazard lectures, leading to familiarity with prostitution and its concomitants are unnecessary and undesirable. High moral instruction should obviate the necessity for any such procedure.

The teaching of sex physiology and sex anatomy in the schools has much to commend it, but this is widely different from the unedifying proposals to associate that teaching with questions of Venereal Disease. This procedure cannot possibly affect the *suppression* of the Disease, and the Royal Commission have specifically advised against it. The production of sex plays and venereal disease problem cinema shows is also of very doubtful value.*

The fact is that the phase now reached in the prevention of Venereal Disease is no more advanced than were the preventive measures against ordinary communicable diseases 40 years ago.

The City Council has, through the subsidiary committees directly concerned, given prolonged and patient attention to the evils resulting from Venereal Diseases, and the methods most calculated to lessen them. These bodies are conversant with the methods which have resulted in the suppression of other forms of disease, and realise the benefits accruing from the beneficent influence exercised by Parliamentary authority. A Sub-Committee specially appointed for the purpose has closely studied the situation in regard to Venereal Diseases during the last two years, and it came to the conclusion that it would be wise to submit for the consideration of Parliament a series of proposals† to apply to Venereal Diseases, so far as they consistently can be applied, the principles of prevention which have proved effective in safeguarding alike the interests of the sufferer, and the interests of the public, in all other forms of infection. These views, based on experiences of the Public Health Acts, and other Acts of Parliament dealing with health, after deliberate consideration, subsequently received the unanimous confirmation of the Health Committee of the Corporation, and, at a later date, the unanimous approval of the Parliamentary Committee. The proposed clauses have also received support from bodies whose views are not less entitled to a respectful consideration. Among them may be mentioned the members of the Liverpool Medical Institution, who, at a meeting specially convened for the purpose of considering the subject, unanimously approved the proposals; no expression of dissent has been received from any medical man in the City. The attitude of the women doctors calls especially for attention. Most, if not all, of them have had a wide experience of the ravages of the diseases amongst women and children attending clinics or voluntary organisations, and without exception the women doctors are favourable to the proposed clauses.

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* Mr. Goodwin, Chairman of the Cinematograph Exhibitors' Association, at their Annual Meeting at the Hotel Cecil, said: "The venereal diseases or sex problem play which the educationalist and doctor thought it desirable to show, was, to the lower classes, simply a 'smutty' story, and was very popular. Exclusion of children under 16 years of age meant a 'full house,' and immediate profit, of which the exhibitor thought first" (*The Times*, 26th February, 1921).

† Measures closely in line with these proposals have already been adopted with success in some of the British Dominions, and also in the United States of America.

The Association of Port Sanitary Authorities have also affirmed the principles, although the details of the suggested clauses of the Bill have not been submitted for their consideration.

The fact must not be lost sight of that, apart from penal provisions, legislation is a valuable instrument of guidance and instruction—a moral deterrent to the ignorant and a restriction upon the evilly disposed; the immense moral value is too obvious to need comment.

A large amount of opinion of various religious denominations also recognises that if legislative measures are necessary to control the relatively minor impulse—say to dishonesty—they are not less necessary to restrain the overwhelming impulse—the first instinct—which ensures the perpetuation of the human race.

There are saintly people, however, not familiar with the Public Health aspects of the subject who are of a contrary opinion and insist that departures from the moral life are justly punished by the infliction of the disease upon others, innocent or guilty, and that the terrors of Venereal Disease are incentives to virtue. No sanitarian would desire any measures which would lessen the moral life; no suggestion ever has been made, nor probably ever will be made, to discard high moral teaching, or to impair influences of morality, but it cannot be accepted that either virtue or religion need an ally so filthy and ignoble as Venereal Disease.

It is noteworthy that in regard to the vice of intemperance the same school of thought adopts a wholly different attitude, and supports with fervour constructive measures for the *prevention* of intemperance (even to the extent of restricting the liberty of the inebriate) as well as for the relief of its consequences.

Moral teaching should take the first place in every educational system, but it must be recognised that a duty to prevent the ravages of disease is the foremost of the obligations of the Sanitary Authority. Interference with the control of disease, whether under the guise of religious teaching or of spurious propaganda can but cripple and fetter the fulfilment of this duty and add to and prolong the sum of avoidable human misery.

The aims of the provisions† which it was desired to submit to the consideration of Parliament were briefly:—

(*a*) To make it incumbent upon every person who knows or who has reasonable grounds for believing that he is infected with Venereal Disease to consult a medical practitioner and to conform with the requirements of the doctor whom he consults.

To make it the duty of parents or persons in charge of feeble minded infected persons or of infected persons under 16 years of age to see that they are placed under treatment.

(*b*) To enable the Corporation to provide free treatment* and suitable hospital accommodation to which patients may be removed who are under treatment or detention in any public institution, and are suffering from Venereal Disease in a communicable form.

Persons of both sexes, but more especially prostitutes under treatment for Venereal Diseases in Poor Law or other Institutions, leave those Institutions at Race times or other events attracting large numbers of people, in order to temporarily pursue their disease-carrying vocation, and return again for further temporary treatment when the aggravation of their own sufferings makes this course imperative. Sympathy and necessity alike demand some control over these unfortunates.

(*c*) To facilitate continuity of treatment until the patients are free from infection.

(*d*) To provide that the knowing wilful and deliberate committal by any man or woman, with the full knowledge that they are diseased, of any act calculated to infect another person would be recognised as a penal offence.*

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* This is already provided.

† See Appendix for Draft of Clauses proposed for consideration.

It was felt that the sanitary necessities of Liverpool are so great as to justify special application to Parliament to meet them; the Port is visited by seamen of every flag and from every Port throughout the World, and it is recognised that the courage which faces the perils and privations of maritime life is often reflected in recklessness where danger from Venereal Diseases is concerned, and where the lure of the prostitute—a recognised reservoir of infection—offers exceptional facility for the interchange of these diseases.

The Merchant Shipping Act of 1906, which provides that the expense incurred in medical treatment of the sick sailor shall be defrayed by the owners of the ship, still retains the proviso that a seaman suffering from Venereal Disease shall be excluded from such benefits.

An opportunity to ask for Parliamentary consideration of the subject was afforded by the Liverpool Bill, which was already in preparation for submission to Parliament. The powers dealing with this matter were, however, omitted from the Bill before its introduction in Parliament.

It may be pointed out that other places besides Liverpool are taking special measures to meet their special difficulties in regard to Venereal Diseases. Portsmouth, for example, has taken a definite step with a view to meet the necessities of a large military and naval centre.† Manchester also is moving in a direction calculated to meet its needs.

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* The infection of very young girls by diseased men appears to originate in the superstition that a sufferer would be relieved of his disease by passing it on to another person.

† The following Extract from Report of Evidence taken by the National Birth-Rate Commission, instituted with official recognition by the National Council of Public Morals indicates the view of that Commission upon the Portsmouth proceedure :—

> "Having regard, however, to the seriousness of the present position, and to the strong possibility that self-disinfection, where efficiently carried out, would lead to the prevention of disease in a certain number of cases in which, in the absence of prompt disinfection, such diesase would develop, the Committee consider that no difficulty should be placed in the way of either :—
>
> (1) The spread of knowledge by such means as will be indicated later as to the use and value of disinfectants, or
>
> (2) The obtaining by individuals of such disinfectants from chemists or other sources which may yet be recommended."

But it is obvious that the authorities of towns under social conditions wholly different from those of Liverpool will neither appreciate nor concern themselves with the necessities of Liverpool. A health resort for example, with no workshops, no hospitals, no foreign nor seafaring population, no prostitutes, no gaol, no workhouse nor Poor Law institution, is on a different footing altogether, and cannot be expected to share a self-imposed burden, nor to interfere with the problems of another district with which it has no concern whatever. Bodies so circumstanced would no doubt attach importance to addresses and cinema shows should they deem it necessary to broach the subject at all. The same observation, *mutatis mutandis*, would apply, say, to the Factory Acts—Acts which, though of general application, have none whatever in some localities and highly important application in others. Contiguous areas affected by the same problems should, if possible, combine to meet them. Adjacent areas, however, in which the problems are wholly different, are in a relatively different category. There is good reason to think that Birkenhead or Bootle, for example, would be willing to co-operate with Liverpool in regard to the repression of Venereal Disease, but there is not the same reason for any active co-operation, say, on the part of Bebington or Wallasey. The closeness of the co-operation in regard to Venereal Diseases between the Port of New York and the Port of Liverpool is noteworthy as showing a community of interests between two seaports, distant geographically, but brought close together by constant daily communication.

The International aspect of sanitation to which the Medical Officer has so frequently called attention derives further emphasis from these incidents, and there is no doubt that a more direct guidance in these matters by the Ministry of Health and by Parliament will be highly beneficial.

It is only fair to mention that the system of clinics now in vogue in Liverpool is admittedly as good as any in the kingdom, and far more advanced than most.

Notwithstanding the time and attention given to the subject by those in authority, and the heavy cost to the ratepayers, much of the value is lost, as will be readily appreciated from the circumstance that 60 per cent. of the patients fail to continue treatment until they are free from infection, a position which no one can regard as satisfactory.

One of the Voluntary associations formed with a view to combat the disease has been made acquainted with the international aspects of the question, which the Medical Officer has so frequently emphasised, but however good a voluntary, but irresponsible, association may be, it has neither the weight, the means of acquiring information, nor the influence attaching either to a Government Department or a Local Authority having statutory powers.

It is thought that Liverpool, both by reason of its geographical situation and the complete manner in which all existing statutory powers in regard to the prevention and treatment of these diseases have in the past been operated in the City, is perhaps the most suitable place in which further powers of an experimental character should be put in force.

Some years ago the Local Government Board issued Regulations under which Local Authorities could provide facilities for free treatment, and in 1917 the Liverpool City Council inaugurated a scheme which linked up all the available facilities of the several general and special hospitals of the City.

At the same time an Act of Parliament entitled the "Venereal Diseases Act, 1917," was brought into force in the area. This gave the Local Authority power to suppress quackery as far as it affected Venereal Diseases.

The clinics which were established were particularly serviceable, and were largely attended by patients. Patients attending the general out-patient departments of the hospitals, and who were suffering from Venereal Diseases, were directed to the department dealing with their special ailment, and particular care was taken that such patients should not be singled out or made conspicuous.

Some of the clinics were so well attended that necessary extensions, both structural and as regards the available staff, were carried out.

Up to the present these clinics have proved a success, and large numbers of sufferers, especially seamen, have taken full advantage of the free treatment.

Clinics are now in operation at the Royal Infirmary, Royal Southern Hospital, David Lewis Northern Hospital, Cancer and Skin Hospital, and Stanley Hospital.

The correct diagnosis is very important, and arrangements have been made for the City Bacteriologist to examine all material sent to him from clinics or private practitioners, and to carry out any Wasserman tests which may be required.

The following is a statement of the work carried out under this heading during the year 1920:—

	No. of Specimens.
Detection of Spirochaetes	46
,, Gonococci	453
Wasserman re-action for Syphilis	5,081
Still-births examined	411
Ophthalmia cases	142
Total Liverpool cases	6,133

Some of the treatment centres have reached a high standard of efficiency. A Table is appended showing the number of patients and attendances. The Royal Infirmary has had the largest number of patients, and certain adjustments in the Medical Staff and the hours at which clinics are held have been made to meet the large numbers of persons requiring treatment. Provision of additional facilities for irrigation treatment has also been made at all the centres and also where desired, disinfecting facilities have been provided for persons who have been exposed to the risk of infection. Where in-patient accommodation has not been sufficient to cope with the numbers of patients requiring treatment, special arrangements have been made for suitable transfers from one hospital to another.

The provisions made by the Venereal Diseases Committee have been well developed, and they would seem for the moment, pending further Government or local legislation, to be adequate. It is felt, however, that something more is required in order to grapple with the problem of the prevention of the disease. Experience has amply shewn that whilst full facilities are available for the treatment of sufferers, and there can be no doubt that these are very fully availed of, as shewn by the numbers of new patients, yet there is still great difficulty in getting patients to continue treatment until they are cured, or free from infection.

Clearly it is a waste of public money and public effort to give treatment which fails to have results. The Public Health object of that treatment is not primarily to benefit the individual, but to protect the public, and if, because of non-continuance of treatment, the individual remains a source of danger and of infection, we have rank waste of money and of effort.

As will be seen from the Table appended, large numbers of patients give up treatment when the local manifestations of the diseases have subsided, and as there is no compulsion exercised on patients to continue their treatment, such persons remain in an infectious condition and consequently a great danger to the public.

TABLE SHOWING TOTAL NUMBER OF NEW CASES OF VENEREAL DISEASE AND THE ATTENDANCES AT THE VARIOUS CITY CLINICS DURING THE YEAR 1920.

Hospital.	Date of opening.	New cases.	Attendances.	Number of Patients on the books.	Ceased to attend before cure completed
Royal Infirmary..........................	1/8/1917	2,804	39,278	4,562	2,455*
Cancer and Skin..........................	31/1/1918	1,219	16,604	1,932	603*
Royal Southern..........................	7/9/1917	761	6,366	1,050	263*
David Lewis Northern	23/6/1919	846	9,183	1,071	600*
Stanley	7/7/1919	597	6,018	712	184*

* Figures not comparable owing to different systems of time limitation.

TABLE SHOWING CLASSIFICATION OF CASES ATTENDING THE LIVERPOOL ROYAL INFIRMARY DURING 1920.

	NEW CASES.			CEASED TO ATTEND BEFORE CURE COMPLETED.			TOTAL ATTENDANCES.		
	M.	F.	Total.	M.	F.	Total.	M.	F.	Total
Syphilis....................	842	209	1,051	975	330	1,305	17,765	4,925	22,69
Gonorrhœa................	1,120	124	1,244	1,071	78	1,149	14,786	803	15,58
Soft Chancre	2	—	2	1	—	1	14	—	1
Suspected cases—examined and found to be free from V.D.	434	73	507	—	—	—	873	112	98
Total	2,398	406	2,804	2,047	408	2,455	33,438	5,840	39,27

Efforts have been made in Liverpool to get the patients back to hospital to continue treatment, and the importance of steady and continuous attendance for treatment under the guidance of the physician has been fully emphasised in each case. In the case of those who have ceased attendance appropriately worded letter-cards have been sent by the doctors of the clinics asking the patient to return.

In the case of seamen who are sometimes compelled to leave the Port and go abroad, arrangements are made so that the patient can be transferred to another clinic to continue his treatment, full particulars of his case and the stage which his treatment has reached being supplied to him for the information of the Medical Officer who subsequently continues treatment.

The Liverpool Medical Officer of Health has made arrangements with the United States Public Health Service to link up with the Service Bureau in New York, so that seamen suffering from Venereal Disease can continue treatment under proper conditions. An address card is issued at the clinics to such seamen patients who are about to sail for that Port:—

Port of Liverpool.

ARRANGEMENTS HAVE BEEN MADE BY THE U.S. PUBLIC HEALTH SERVICE FOR THE FREE MEDICAL RELIEF OF SEAMEN OF ALL NATIONALITIES, ESPECIALLY THOSE AFFECTED WITH VENEREAL DISEASES AT THE UNDERMENTIONED CENTRE:—

SEAMEN'S SERVICE CENTRE,
"FOR SEAMEN OF ALL FLAGS,"
21, COENTIES SLIP,
NEW YORK, N.Y.

Liverpool Port Sanitary Authority,
April, 1920.

Facilities for free treatment of a similar character are open at all our Venereal Diseases clinics to American or other foreign sailors.

The occupations followed by the patients attending the Clinics at the Royal Infirmary are of interest:—

MALES.	
Seafaring people	880
(Of these 138 were foreign.)	
Artizans	991
Miscellaneous	492
(Clerks, Agents, Hawkers, &c.)	
	2,363

FEMALES.	
Housewife	194
Home duties	24
Unemployed	10
Shop Assistants	7
Factory hands	5
Kitchen hands	7
Housemaids	5
Waitresses	8
Domestic Servants	8
Other occupations	60
	328

61 per cent. of the total patients registered were discharged soldiers or sailors.

37 per cent. of the total patients registered were seafaring people.

15 per cent. of the latter were not natives of the British Isles, and were classed as follows:—

U.S.A. and Canada, 58; Norway and Sweden, 25; other nationalities, 55.

The ages range from 15 to 67, but the majority were between the ages of 20 and 30 years.

V.D. ACT, 1917.—It will be remembered that in 1920 an important prosecution was undertaken in connection with quack treatment of Venereal Disease by a person in Glasgow. The original information on which the case was undertaken was obtained in Liverpool at one of the V.D. clinics. A sentence of six months' imprisonment was imposed.

Recently two persons were convicted of an offence under the same Act, in that they prescribed a herbal remedy for the treatment of Venereal Disease. One was sentenced to two months' and the other to six months' imprisonment.

The provision of a dispensary for seamen has been under the consideration of the Committee for some time, but great difficulty has been experienced in finding suitable premises convenient to the Seamen's Home.

Special Notices on the "Health of Seamen" have been distributed and placed on board ships and in places frequented by sailors. These notices are in English, Chinese, Norwegian, and Spanish.

The following drugs have been issued to Institutions and medical practitioners by the Department during the year 1920:—

ISSUE OF DRUGS TO CLINICS, HOSPITALS, AND PRIVATE PRACTITIONERS DURING 1920 FOR THE TREATMENT OF VENEREAL DISEASES.

Clinics, etc.	Novarsenobillon.					Neokharsivan.					Galyl.						Kharsivan.
	0·15	0·3	0·45	0·6	0·9	0·3	0·45	0·6	0·75	0·9	0·15	0·20	0·25	0·30	0·35	0·40	0·40
Royal Infirmary	50	610	—	3,862	120	144	—	1,008	—	456	—	—	—	—	—	—	—
Cancer and Skin Hospital ...	110	1,280	210	1,580	50	12	84	492	—	—	—	—	—	—	—	—	—
Stanley Hospital	—	870	250	1,620	120	12	—	—	—	—	—	—	—	—	—	—	—
Royal Southern Hospital ...	10	—	10	20	20	144	—	324	—	1,272	10	6	—	6	—	—	—
D.L. Northern Hospital ...	—	40	20	10	—	378	380	280	108	48	—	—	—	—	—	—	—
H.M. Prison Hospital ...	—	120	160	259	580	—	—	—	—	—	—	—	—	—	—	—	—
Walton Institution	—	200	10	200	270	—	—	—	—	—	—	—	—	—	—	—	—
Belmont Institution	—	—	—	—	—	—	12	348	36	—	—	—	—	—	—	—	—
Edge Lane Hospital	10	40	50	110	60	36	—	24	—	48	—	—	—	—	—	17	—
Brownlow Hill Institution ...	—	—	310	—	20	—	3	12	—	66	—	—	—	9	—	—	48
Fazakerley Sanatorium ...	—	—	—	—	—	36	—	24	—	—	—	—	—	—	—	—	—
St. Paul's Eye Hospital ...	—	16	10	10	10	—	—	—	—	—	—	—	—	—	—	—	—
Mill Road Infirmary ...	—	—	—	—	—	—	2	4	—	—	—	—	—	—	—	—	—
Port Sanitary Hospital ...	—	—	—	—	—	—	—	5	—	—	—	—	—	—	—	—	—
34 Private Practitioners ...	20	658	142	550	100	112	376	449	186	300	72	12	67	23	59	108	6
TOTALS—																	
Clinics, etc.	180	3,176	1,030	7,671	1,250	762	481	2,521	144	1,890	10	6	—	15	—	17	48
Private Practitioners...	20	658	142	550	100	112	376	449	186	300	72	12	67	23	59	108	6
GRAND TOTAL	200	3,834	1,172	8,221	1,350	874	857	2,970	330	2,190	82	18	67	38	59	125	54

	To Clinics.		To Practitioners.
Total Number of Doses of Novarsenobillon	13,307	...	1,470
„ „ „ Neokharsivan	5,798	...	1,423
„ „ „ Galyl	48	...	341
„ „ „ Kharsivan	48	...	6

Approximately one-sixth of the drugs enumerated above have been issued to 34 medical practitioners who applied for them.

TABLE 7.

INFECTIOUS DISEASE.

The actual number of cases of Infectious Sickness amongst civilians landed from vessels arriving in the Port of Liverpool during the years 1919 and 1920, and the comparison with the average of the preceding 10 years, is shown in the following table:—

Diseases.	Number of Cases.		Average for the 10 years preceding 1919.
	1919.	1920.	
Smallpox	7	1	4·6
Scarlatina	30	12	13·4
Cerebro Spinal Meningitis	2	0	0·4
Poliomyelitis	0	0	0·0
Typhus	1	0	0·0
Enteric Fever	25	14	34·8
Do. (suspected)	6	5	4·5
Diphtheria	11	16	8·7
Measles	12	63	28·2
German Measles	0	0	1·7
Whooping Cough	0	0	0·1
Erysipelas	3	2	6·3
Chicken Pox	21	6	8·1
Cholera and Choleraic Diarrhœa	0	0	0·6
Yellow Fever	0	0	0·4
Plague	1	0	0·1
Suspected Plague	0	0	2·8
Puerperal Fever	0	0	0·0
Phthisis	34	48	50·5
Tuberculosis (other forms of)	1	0	0·1
Anthrax	1	0	0 0
*Pneumonia and Influenza	86	22	0·0
*Malaria	83	26	0·0
*Trench Fever	0	0	0·0
*Dysentery	6	3	0·0
Totals	330	218	165·3

* Notifiable from 1st March, 1919.

TABLE 8.

INFECTIOUS DISEASE.

The number of cases of Infectious Sickness reported to have occurred on Liverpool-bound ships during the years 1919 and 1920, and which were disposed of prior to the arrival of the vessel at this port, and the average of such cases for the preceding 10 years, are as follows:—

Diseases.	Number of Cases.		Average for the 10 years preceding 1919.
	1919.	1920.	
Smallpox	16	17	17·4
Scarlatina	1	1	1·2
Cerebro Spinal Meningitis	1	0	1·2
Enteric Fever	5	10	15·2
Para-Typhoid	0	1	0·0
Diphtheria	2	1	3·1
Measles	5	49	7·2
German Measles	0	0	1·0
Erysipelas	0	2	1·1
Chicken Pox	4	13	4·9
Cholera and Choleraic Diarrhœa	0	0	0·0
*Malaria	380	817	0·0
Yellow Fever	0	0	2·8
Plague	2	1	2·1
Suspected Plague	0	1	0·9
Phthisis	7	17	3·4
Tuberculosis (other forms of)	6	3	0·1
* Pneumonia and Influenza	23	38	0·0
* Dysentery	2	6	0·0
Totals	454	977	61·6

* Notifiable from 1st March, 1919.

The following Table gives particulars of the 324 vessels Disease on Board, with the measures adopted in each case :—

TABLE 9.

Date 1920.	Name of Vessel.	Where from.	Nature of Sickness.	Hospital to which Patient was removed.
Jan. 1	**Birchol**	Manchester	Measles	Fazakerley
Jan. 1	**Megna**	Sierra Leone	Pneumonia	New Ferry
Jan. 5	**Steigerwald**	India	Malaria (1 case) and Influenza (7 cases)	... ...
Jan. 6	**Explorer**	Calcutta	Pneumonia	... ...
Jan. 6	**City of Baroda**	Glasgow	Chicken-pox (3 cases)	Glasgow
Jan. 8	**Tartar Prince**	Alexandria	Plague (?)	... ...
Jan. 9	**Martaban**	Rangoon	Enteric Fever	Northern
Jan. 11	**City of Poona**	Bombay	Chicken-pox (2 cases)	... ...
Jan. 12	**Scandinavian**	Montreal	Measles (4 cases)	Fazakerley
Jan. 12	**Scandinavian**	Montreal	Pneumonia	Northern
Jan. 12	**Meteor**	Alexandria	Measles	... ...
Jan. 12	**Elmina**	West Coast of Africa	Malaria (5 cases)	... ...
Jan. 12	**Biafra**	Galveston	Malaria	... ...
Jan. 13	**Ardeola**	Teneriffe	Pneumonia	... ...

reported on their arrival as having, or having had, Zymotic

REMARKS.
The patient, one of the crew, a seaman, was removed to hospital, and the vessel and bedding disinfected.
The patient, the chief steward, was removed to the Port Hospital.
The sickness all occurred amongst the troops during the voyage. Two of the men were landed at Aden.
The patient, one of the native seamen, was removed to hospital.
Three of the Native crew, suffering from Chicken-pox, were removed to hospital in Glasgow.
The case was that of a fireman who was removed to hospital at Piraeus, disinfection being carried out at that port. The vessel proceeded to Manchester.
The patient, one of the crew (a butcher), was removed to the Northern Hospital. The sickness proved to be non-infectious.
One of these was removed to the Balmoral Nursing Home; the other, being convalescent on arrival, was allowed to proceed. Disinfection of the vessel and bedding was carried out.
The cases, all passengers, were removed to the City Hospital, Fazakerley, and the vessel and bedding disinfected.
A passenger, suffering from Pneumonia, was removed to the David Lewis Northern Hospital.
A child passenger had Measles during the homeward voyage.
The patients, all members of the crew, had suffered during the voyage.
The patient died on the outward voyage to Galveston.
The patient, a passenger, died at sea on the outward voyage.

Date 1920.	Name of Vessel.	Where from.	Nature of Sickness.	Hospital to which Patient was removed.
Jan 15	**Skegness** ...	Lagos ...	Malaria ... (5 cases)	... ...
Jan. 16	**Linmere** ...	West Coast of Africa	Malaria ... (2 cases)	... ...
Jan. 17	**Pendeen** ...	West Coast of Africa	Malaria ... (2 cases)	Northern ...
Jan. 17	**Bonny** ...	West Coast of Africa	Malaria ... (9 cases)	... ...
Jan. 19	**Tasmania** ...	Adelaide ...	Diphtheria ...	Mill Lane ...
Jan. 22	**Teutonic** ...	Outward bound	Pneumonia...	... ...
Jan. 22	**Metagama** ..	St. Johns ...	Scarlatina ... (3 cases)	Fazakerley Annexe
Jan. 25	**Appam** ...	West Coast of Africa	Malaria ... (10 cases)	... ...
Jan. 29	**Accra** ...	West Coast of Africa	Malaria ... (3 cases)	... ...
Jan. 29	**K. A. Victoria**	New York ...	Pneumonia...	Walton ...
Jan. 29	**K. A. Victoria**	New York ...	Measles ... (2 cases)	Fazakerley ...
Feb. 2	**Harmonic** ...	West Coast of Africa	Malaria ... (11 cases)	... ...
Feb. 3	**Vauban** ...	River Plate..	Influenza ... (3 cases)	... ...
Feb. 6	**Grampian** ..	St. John's ...	Malaria ...	... ...
Feb. 6	**Warwickshire**	Rangoon ...	Dysentery ...	Brownlow Hill
Feb. 6	**Herakles** ...	West Coast of Africa	Malaria ...	... ...

REMARKS.

All members of the crew, who had suffered during the voyage.

Two of the crew were ill during the voyage.

On arrival in this Port, one of these, a seaman, was removed to the Northern Hospital; the other, one of the crew, was landed at Las Palmas on the home voyage.

All members of the crew, who had suffered during the voyage.

The fourth engineer, who was suffering from Diphtheria, was removed to hospital and the vessel and bedding disinfected.

One of the crew, a steward, died on board, whilst in the river, prior to the vessel sailing.

The patients, all second class passengers, were removed to the City Hospital, Fazakerley, and the vessel and bedding disinfected.

Ten of the crew suffered from Malaria during the voyage.

All members of the crew, who had suffered during the voyage.

The patient, a saloon passenger, was removed to the Walton Infirmary.

Two passengers, suffering from Measles, were removed to hospital, and the vessel and bedding disinfected.

Eleven of the crew had suffered from Malaria during the voyage.

The patients, three passengers, died during the home passage. The vessel was disinfected by the ship's doctor.

The patient, a Roumanian passenger, died, and was buried at sea.

One of the crew (a Lascar) was removed to the Brownlow Hill Institution Hospital.

One of the crew had Malaria during the homeward voyage.

Date 1920.	Name of Vessel.	Where from.	Nature of Sickness.	Hospital to which Patient was removed.
Feb. 6	**Prah**	West Coast of Africa	Malaria ... (9 cases)	... ...
Feb. 6	**Cedric** ...	New York ...	Pneumonia...	... ...
Feb. 6	**Hebe**	Richbuctoo...	Scarlatina ...	Fazakerley ...
Feb. 8	**Carmania** ...	New York ..	Small-pox . . ?	New Ferry ...
Feb. 8	**Carmania** ...	New York ...	Measles ... (2 cases)	Fazakerley ...
Feb. 8	**Carmania** ...	New York ...	Influenzal Pneumonia (2 cases)	... ...
Feb. 8	**Minnedosa** ...	Bombay ...	Influenza ..	Walton Institution
Feb. 8	**Minnedosa** ...	Bombay ...	Pneumonia... (2 cases)	... ...
Feb. 10	**City of Cairo**	Karachi ...	Pneumonia...	... ...
Feb. 11	**Hanover** ...	New Orleans	Phthisis ...	Mount Pleasant
Feb. 12	**Bavarian** ...	Alexandria ...	Malaria ...	... ...
Feb. 13	**Demerara** ...	River Plate...	Para Typhoid	... ...
Feb. 13	**Orbita** ...	South America	Malaria ... (3 cases)	... ...
Feb. 15	**Scandinavian**	Halifax ...	Measles ...	Fazakerley ...
Feb. 15	**Scandinavian**	Halifax ...	Pneumonia... (2 cases)	... ...

REMARKS.

All members of the crew, who had suffered during the voyage.

The patient, a third class passenger, died on the homeward passage.

The patient, a seaman, was removed to hospital, and the vessel and bedding disinfected.

The patient, a child passenger, was removed to the Port Hospital, and disinfection of the vessel and bedding carried out. The sickness proved to be Chicken-pox.

One of these, being convalescent on arrival, and free from infection, was allowed to proceed to her home in Bolton. The other was removed to the City Hospital, Fazakerley.

The patients, two seamen, died at sea on the homeward passage.

Two of the crew, suffering from Influenza, were removed to the Walton Institution Hospital.

Two deaths occurred amongst the crew during the home passage.

One case occurred during the voyage.

The patient was removed to hospital.

One of the crew suffered during the voyage.

The patient, the fourth officer, was left in hospital at Rio Janeiro.

The cases occurred amongst the crew on the homeward passage.

The patient, a child passenger, was removed to the City Hospital, Fazakerley.

The patients, two passengers, died and were buried at sea.

Date 1920.	Name of Vessel.	Where from.	Nature of Sickness.	Hospital to which Patient was removed.
Feb. 15	**Priam** ...	Java ...	Malaria ... (8 cases)	... ...
Feb. 16	**Classic** ...	Belfast ...	Influenzal Pneumonia	Northern
Feb. 16	**Eboe** ...	West Coast of Africa	Malaria ... (5 cases)	... ...
Feb. 17	**Oakmere** ...	West Coast of Africa	Malaria ... (4 cases)	... ...
Feb. 19	**Mallancha** ...	Glasgow ...	Measles ..	Fazakerley ...
Feb. 21	**Tydeus** ...	Colombo ...	Malaria ...	... ...
Feb. 21	**Ortega** ...	Valparaiso ...	Measles ... (2 cases)	... ...
Feb. 25	**Eurydames** ...	Vancouver ...	Tuberculosis	... ...
Feb. 25	**Egba** ...	West Coast of Africa	Malaria ... (9 cases)	... ...
Feb. 27	**Metagama** ...	St. John's ...	Phthisis ...	Mount Pleasant
Feb. 27	**Metagama** ...	St. John's ...	Pneumonia ..	... ...
Feb. 28	**Ebani** ...	West Coast of Africa	Malaria ... (5 cases)	... ...
Feb. 29	**Sheaf Dart** ...	West Coast of Africa	Malaria ...	... ...
Feb. 29	**Egwanga** ...	West Coast of Africa	Malaria .. (3 cases)	... ...
Feb. 29	**West Ekonk**	Norfolk, Va.	Influenzal Pneumonia	Walton Institution
Mar. 3	**Anselm** ...	Manaos ..	Smallpox ... (3 cases)	... ...

REMARKS.

Eight of the crew suffered from Malaria during the voyage.

One of the crew, a fireman, was removed to the Northern Hospital.

A steward, suffering from Malaria, was landed at Secondi. Four other members of the crew had Malaria during the voyage.

Four of the crew had Malaria during the voyage.

The patient, one of the crew, was removed to the City Hospital, Fazakerley.

The patient, a passenger, proceeded to his home.

Two passengers suffered from Measles during the homeward passage.

The patient, a Chinese seaman, was treated on board, and was sent back to China.

One of these, a seaman, was landed at Lagos ; the other eight suffered during the voyage.

The patient, a third class passenger, was removed to hospital.

The patient, a saloon passenger, died on the homeward passage.

Five cases occurred amongst the crew during the voyage.

One of the crew had Malaria during the voyage.

Three cases occurred amongst the crew during the voyage.

The patient, a member of the crew, was removed to the Walton Institution Hospital.

Two second class passengers and a steward, suffering from Smallpox, were left in hospital at Para. The crew and passengers were re-vaccinated by the ship's surgeon, and the vessel disinfected by the Brazilian Authorities.

Date 1920.	Name of Vessel.	Where from.	Nature of Sickness.	Hospital to which Patient was removed.
Mar. 4	**Carisbrooke**	Burutu ...	Malaria ... (7 cases)	... ...
Mar. 4	**Burma** ...	Rangoon ...	Pneumonia...	... ...
Mar. 5	**Salaga** ...	West Coast of Africa	Malaria ... (8 cases)	... .
Mar. 8	**Melita** ...	Montreal ...	Diphtheria ..	Mill Lane ...
Mar. 8	**Oswestry** ...	West Coast of Africa	Malaria ... (7 cases)	... ...
Mar. 9	**Polbain** ...	Belfast ...	German Measles	Fazakerley ...
Mar. 10	**Sweethorpe**...	West Coast of Africa	Malaria ... (2 cases)	... ...
Mar. 11	**Elmina** ...	West Coast of Africa	Malaria ... (5 cases)	... ...
Mar. 14	**Canada** ...	St. John's ...	Phthisis ...	... ...
Mar. 16	**Benue** ...	West Coast of Africa	Malaria ... (7 cases)	... ...
Mar. 18	**Carmania** ...	New York ...	Measles ...	Fazakerley ...
Mar. 18	**Carmania** ...	New York ...	Phthisis ...	... ...
Mar. 18	**Inkenturm** ...	Bahia ...	Phthisis ...	Birkenhead ...
Mar. 20	**Telamon** ...	China ...	Phthisis ...	... ...
Mar. 21	**Aguila** ...	Canaries ...	Enteric Fever	... ...
Mar. 21	**Baltic** ...	New York ...	Measles ...	... ...

REMARKS.

All the cases occurred amongst the crew during the voyage.

A native fireman suffered from Pneumonia during the home passage.

The cases all occurred amongst the crew during the voyage. All were well on arrival.

A child second class passenger, having Diphtheria, was removed to hospital and the vessel and bedding disinfected.

All members of the crew, who had suffered during the voyage.

The patient was removed to the City Hospital, Fazakerley.

A seaman, and the donkeyman, had Malaria during the voyage.

All the cases occurred amongst the crew during the voyage.

The patient proceeded to his home in Banbury.

Seven of the crew had Malaria during the voyage.

The patient, a second class passenger, was removed to the City Hospital, Fazakerley.

The patient proceeded to his home in Ireland.

The patient, a native greaser, was removed to the Birkenhead Borough Hospital.

The patient, a saloon passenger, died on the homeward passage, and was buried at sea.

A saloon passenger, suffering from Enteric Fever, was removed to a private nursing home in the City. Disinfection of the vessel and bedding was carried out.

The case had recovered on arrival in this Port.

Date 1920.	Name of Vessel.	Where from.	Nature of Sickness.	Hospital to which patient was removed.
Mar. 24	**City of London**	Calcutta ...	Small-pox ... (3 cases)	... ...
Mar. 24	**Rabymere** ...	West Coast of Africa	Malaria ...	... ...
Mar. 25	**Hildebrand** ...	Brazil ...	Malaria .. (2 cases)	... ...
Mar. 25	**Appam** ...	West Coast of Africa	Malaria ... (10 cases)	... ...
Mar. 25	**Clan Robertson**	Calcutta ...	Chicken-pox	... ...
Mar. 29	**Fantee** ...	Calcutta ...	Measles ...	Grafton Street
Mar. 30	**Orestes** ...	China ...	Malaria ...	... ...
Mar. 30	**Yarborough**...	Dakar ...	Malaria ... (3 cases)	... ...
Mar. 30	**Oxfordshire**...	Rangoon ...	Small-pox ...	... ...
April 1	**City of Exeter**	Karachi ...	Chicken-pox (2 cases)	Brownlow Hill
April 2	**Olympia** ...	Bombay ...	Small-pox ...	... ...
April 2	**Metagama** ...	St. John's ...	Measles ... (3 cases)	Fazakerley ...
April 3	**Prahsu** ...	West Coast of Africa	Malaria ... (2 cases)	... ...
April 7	**Flaxmere** ...	West Coast of Africa	Malaria ... (3 cases)	... ...
April 7	**Badagri** ...	West Coast of Africa	Malaria ... (5 cases)	... ...

REMARKS

Two native firemen, suffering from Smallpox, were landed at Suez on the 27th February, and on arrival in London another case, also a native fireman, was landed. Vaccination and disinfection carried out by the London Port Authorities.

The patient died on the 17th February, the body being buried at Port Harcourt.

The patients, two passengers, were landed, one at Lisbon, and the other on arrival in this Port. Both proceeded to their homes.

Five of the crew and five passengers suffered from Malaria during the voyage.

A native saloon boy was removed to hospital at Glasgow, where disinfection of the vessel was carried out.

The patient was removed to the City Hospital, Grafton Street.

One of the crew had Malaria during the voyage.

Three of the crew suffered from Malaria during the voyage.

The patient, one of the native crew, was landed at Colombo, where vaccination and disinfection was performed.

One of the cases was landed at Bombay; the other, on arrival in this Port, was removed to the Brownlow Hill Institution Hospital.

The patient, one of the native crew, was landed at Suez on the homeward passage.

Two steerage passengers suffered from Measles on the outward passage; the third case, on arrival in this Port, was removed to Fazakerley Hospital.

Two of the crew had Malaria during the voyage.

All members of the crew, who were ill during the voyage.

All members of the crew, who were ill during the voyage

Date 1920.	Name of Vessel.	Where from.	Nature of Sickness.	Hospital to which Patient was removed.
April 7	**Akabo** ...	West Coast of Africa	Malaria ...	... ...
April 12	**Melita** ...	St. John's ...	Scarlatina ..	Fazakerley ...
April 12	**Carnarvon-shire**	Santos ...	Malaria ...	... ...
April 12	**Regina** ...	New York ...	Measles ...	Fazakerley ...
April 13	**Cap Ortegal**...	West Coast of Africa	Malaria ... (5 cases)	... ...
April 13	**Clan McBean**	Chittagong ...	Chicken-pox (6 cases)	... ...
April 18	**Bhamo** ...	Rangoon ...	Pneumonia...	Northern ...
April 19	**General Allenby**	West Coast of Africa	Malaria ... (8 cases)	... ...
April 19	**Empress of France**	St. John's ...	Malaria ...	... ...
April 21	**Patani** ...	West Coast of Africa	Malaria ... (11 cases)	... .
April 24	**Huanchaco** ...	Alexandria ...	Small-pox ..	... ...
April 26	**Onitsha** ...	West Coast of Africa	Malaria ... (9 cases)	... ...
April 27	**Megna** ...	West Coast of Africa	Malaria .. (2 cases)	... ...
April 27	**Baltic** ...	New York ...	Measles ... (2 cases)	Grafton Street
April 28	**Cedric** ...	New York ...	Pneumonia... (2 cases)	... ...
April 30	**Megantic** ...	New York ...	Scarlatina ...	Grafton Street

REMARKS.

The quartermaster of this vessel suffered from Malaria during the voyage.

The patient, one of the crew (a Butcher), was removed to hospital and the vessel and bedding disinfected.

The patient, one of the crew, jumped overboard at sea.

The case was removed to hospital and the vessel and bedding disinfected.

All members of the crew, who had suffered during the voyage.

A native cook was removed to hospital at London, and five more natives were taken to hospital on arrival at Glasgow, all suffering from Chicken-pox.

The patient, a Lascar seaman, was removed to the Northern Hospital.

All members of the crew, who had suffered during the voyage.

The patient, a steward, had recovered on arrival in this Port.

All members of the crew, who had been ill during the voyage.

The patient, a Maltese, was landed at Marseilles, vaccination and disinfection being carried out by the Authorities at Marseilles.

All members of the crew, who had suffered during the voyage.

Both of these, members of the crew, had been ill during the voyage.

The patients, two third class passengers, were removed to the City Hospital, South, Grafton Street.

These cases occurred on the outward passage to New York, where disinfection was carried out.

The patient, a third class passenger, was removed to hospital, and the vessel and bedding disinfected.

Date, 1920.	Name of Vessel.	Where from.	Nature of Sickness.	Hospital to which Patient was removed.
May 3	**Minnedosa** ...	St. John's ...	Measles ... (2 cases)	Fazakerley ...
May 3	**Egori** ...	West Coast of Africa	Malaria ... (5 cases)	... .
May 4	**K. A. Victoria**	New York ...	Measles ...	... ...
May 4	**Barrocos** ...	West Coast of Africa	Malaria ... (8 cases)	... ...
May 5	**Novian** ...	New Orleans	Enteric Fever	Northern ...
May 6	**Accra** ...	West Coast of Africa	Malaria ... (4 cases)	... ...
May 6	**New Texas** ..	West Coast of Africa	Enteric Fever (2 cases)	... ...
May 7	**Metagama** ...	St. John's ...	Measles ... (3 cases)	... ...
May 7	**Demerara** ...	Buenos Ayres	Measles ...	... ...
May 10	**Betwa** ...	West Coast of Africa	Malaria ... (5 cases)	... ...
May 12	**Inveric** ...	Glasgow ...	Measles ...	Grafton Street
May 13	**Ayrshire** ..	Australia ...	Measles ...	Fazakerley ...
May 13	**Anselm** ...	Manaos ...	Malaria ...	... ...
May 14	**Frankfurt** ..	Bombay ...	Small-pox ...	... ...
May 14	**Johanna** ...	West Coast of Africa	Malaria .. (4 cases)	... ...
May 17	**Cyclops** ...	China ...	Pneumonia... (4 cases)	... ...

REMARKS.

The patients, two children, were removed to hospital, and the vessel and bedding disinfected.

Five of the crew suffered from Malaria during the voyage.

A saloon passenger, suffering from Measles, was removed to private apartments in the City for nursing, and the vessel and bedding disinfected.

Eight of the crew suffered from Malaria during the voyage.

The patient, an apprentice, was removed to hospital, and the vessel and bedding disinfected.

Four of the crew had been ill with Malaria during the voyage.

Two cases occurred during the voyage; one was left at Cape Town, the other died and was buried at sea.

The patients, saloon passengers, had all recovered on arrival in this Port.

One of the crew (a fireman) having Measles, was landed at Buenos Ayres on the homeward passage.

All members of the crew, who had suffered from Malaria during the voyage.

The fourth engineer, suffering from Measles, was removed to hospital, and the vessel and bedding disinfected.

The patient, the second officer, was removed to hospital, and the vessel and bedding disinfected.

One of the crew had Malaria on the homeward passage.

The patient (a trimmer) was landed at Suez, together with one contact. Vaccination and disinfection of the vessel was carried out at Suez.

One fireman was removed to hospital, and three other cases occurred during the voyage.

Four pilgrims died of Pneumonia whilst the vessel was at sea.

Date 1920.	Name of Vessel.	Where from.	Nature of Sickness.	Hospital to which Patient was removed.
May 17	**Fagern** ...	West Coast of Africa	Malaria ... (3 cases)	... ...
May 18	**Patricia** ...	Bombay ...	Small-pox ... (3 cases)	... ...
May 19	**Victorian** ...	Montreal ...	Measles ... (9 cases)	Fazakerley ..
May 20	**Appam** ...	West Coast of Africa	Malaria ... (3 cases)	... ...
May 21	**Corsican** ...	Montreal ...	Measles ... (3 cases)	... ...
May 24	**Bonny** ...	West Coast of Africa	Malaria ... (19 cases)	.. ..
May 24	**City of Poona**	Karachi .	Small-pox ...	... ...
May 24	**Celtic** ...	New York ...	Measles ...	Fazakerley ...
May 24	**Zaria** ...	West Coast of Africa	Dysentery ...	Southern ...
May 25	**Melita** ...	Montreal ...	Measles ... (2 cases)	Grafton Street
May 25	**Boutry** ...	West Coast of Africa	Malaria ... (11 cases)	... ...
May 25	**Palma** ...	West Coast of Africa	Malaria ... (2 cases)	... ...
May 25	**Orcoma** ...	South America	Dysentery ...	... ...
May 25	**Brescia** ...	Alexandria ...	Enteric Fever	... ...
May 29	**Vauban** ...	La Plata ...	Measles ...	... ...

REMARKS.

Three of the crew suffered during the voyage.

A passenger suffering from Smallpox was landed at Malta on the outward passage. A fireman was landed at Bombay, and a stewardess at Gibraltar, on the return voyage, both having smallpox. Disinfection of the vessel and bedding was carried out, and list of all on board was obtained, after inspection.

One of the cases was removed to the City Hospital, Fazakerley; the others all occurred during the voyage.

Three of the crew had Malaria during the voyage.

The patients, three children, had Measles during the trip, and were convalescent on arrival in this Port.

Nineteen members of the crew suffered from Malaria during the homeward voyage, eleven being left in hospital at Accra.

Two of the native crew, having Smallpox, were landed at Bombay on the 15th of April. They joined the vessel at Karachi. Re-vaccination and disinfection of the vessel being carried out at Bombay.

The patient was removed to hospital, and the vessel and bedding disinfected.

The patient, a saloon passenger, was removed to the Southern Hospital.

Two children, suffering from Measles, were removed to the City Hospital, and the vessel and bedding disinfected.

All members of the crew, who suffered from Malaria during the voyage.

The patients, two deck boys, were landed at Sierra Leone.

A saloon passenger had Dysentery during the home passage.

The patient, one of the crew, was left in hospital at Alexandria.

A child, saloon passenger, suffered from Measles on the outward passage.

Date, 1920.	Name of Vessel	Where from.	Nature of Sickness.	Hospital to which Patient was removed.
May 29	**Drachenfels**...	Adelaide ...	Erysipelas ...	Walton Institution
May 31	**Linmere** .	West Coast of Africa	Malaria ... (13 cases)	... ...
May 31	**Justesen** .	Duala ...	Suspected Plague	New Ferry ...
May 31	**Justesen** ...	Duala ..	Malaria ...	New Ferry ...
June 1	**Baltic** ...	New York ...	Measles . (3 cases)	Fazakerley ...
June 2	**Caronia** ...	New York ...	Small-pox ...	... ...
June 2	**Caronia** ...	New York ...	Measles ... (2 cases)	Fazakerley ...
June 2	**Caronia** ...	New York ...	Pneumonia... (2 cases)	Brownlow Hill Infirmary
June 5	**Akari** ...	West Coast of Africa	Malaria .. (12 cases)	... ...
June 5	**Segama River**	Buenos Ayres	Enteric Fever	... ...
June 7	**Minnedosa** ...	Montreal ...	Measles ... (4 cases)	Grafton Street
June 7	**Minnedosa** ..	Montreal ..	Scarlatina ..	Fazakerley ...
June 7	**Sheridan** ...	Rosario ...	Enteric Fever	... ...
June 10	**Benin** ...	West Coast of Africa	Malaria ... (12 cases)	... ...
June 10	**Victorian** ...	Montreal ...	Enteric Fever	Northern ...
June 11	**Haverford**	New York ..	Measles ...	Grafton Street

REMARKS.

The patient, one of the crew, was removed to hospital.

The sickness occurred amongst the crew on the voyage.

The patient was removed to the Port Hospital, and disinfection carried out. The sickness proved to be non-infectious.

The patient, one of the crew, was removed to the Port Hospital.

Two of the cases (passengers) were convalescent on arrival; the third was removed to hospital, and the vessel and bedding disinfected.

The patient, a saloon passenger, was landed and taken into hospital at Plymouth.

Two children, third class passengers, were removed to the City Hospital, Fazakerley.

The patients (one of the crew and a passenger) were removed to hospital, and the vessel and bedding disinfected.

The sickness occurred amongst the passengers and crew during the voyage.

The patient was landed at Las Palmas, where disinfection was carried out.

Three of these passengers were removed to hospital; the other, being convalescent on arrival, was allowed to proceed to his home.

The patient, a passenger, was removed to the City Hospital, and the vessel and bedding disinfected.

The patient was landed at Monte Video.

The patients, all members of the crew, suffered from Malaria during the voyage.

The patient, a cook on this vessel, who had gone to his home, was removed to hospital and the usual disinfection carried out.

The patient (a child passenger) was removed to the City Hospital, Grafton Street.

Date, 1920.	Name of Vessel.	Where from.	Nature of Sickness.	Hospital to which Patient was removed.
June 11	**Batanga** ...	West Coast of Africa	Malaria ... (16 cases)	... ...
June 11	**Biafra** ...	West Coast of Africa	Malaria ... (15 cases)	... ...
June 11	**Thomas Holt**	West Coast of Africa	Malaria ... (2 cases)	... ...
June 14	**Bassam** ...	West Coast of Africa	Malaria ... (2 cases)	... ...
June 15	**Metagama** ...	Montreal ...	Measles ... (2 cases)	Grafton Street
June 15	**Metagama** ...	Montreal ...	Phthisis .. (2 cases)	... ...
June 15	**Orduna** ...	West Coast of S. America	Measles ... (7 cases)	Fazakerley ...
June 19	**Darro** ...	River Plate...	Measles ... (11 cases)	... ...
June 21	**Kaiserin A. Victoria**	New York ...	Measles ... (3 cases)	... ...
June 21	**Canada** ...	Montreal ...	Measles ...	Grafton Street
June 21	**Canada** ...	Montreal ...	Phthisis ...	... ...
June 22	**Corsican** ...	Montreal ...	Measles ... (2 cases)	Grafton Street
June 22	**Corsican** ...	Montreal ...	Chicken-pox (2 cases)	... ...
June 23	**Huallaga** ...	Callao ...	Malaria ...	... ...
June 24	**Deseado** ..	Buenos Ayres	Phthisis ..	... ...
June 24	**Empress of France**	Quebec ...	Phthisis ...	... ...

REMARKS.

Sixteen members of the crew, who had suffered from the sickness during the voyage.

The patients, all members of the crew, suffered during the voyage.

Two of the crew suffered from the sickness during the home passage.

Two of the crew suffered during the voyage.

The patients, two children, were removed to the City Hospital, and the usual disinfection carried out.

The patients were two lady passengers; one of these died on the home passage, the other, on arrival, proceeded to her home in Yorkshire.

Five of these patients (children) were removed to the City Hospital, one to her home in Rock Ferry, and the other to a nursing home in the City. Thirty-nine more cases occurred during the voyage, but these had all recovered on arrival in this Port.

Eleven cases occurred during the voyage; all had recovered before arrival here.

The patients (three passengers) were removed to a nursing home in Upper Duke Street, in this City.

A child passenger was removed to the City Hospital, and the usual disinfection was carried out.

A passenger who proceeded to his home in Great Harwood, Lancashire.

The patients were removed to the City Hospital, and the vessel and bedding disinfected.

The patients, who were convalescent on arrival, proceeded to their homes.

Three of the crew suffered during the voyage.

The patient, the Marconi operator, proceeded to his home in Cheltenham.

Patient proceeded to home in Torquay.

Date, 1920.	Name of Vessel	Where from.	Nature of Sickness.	Hospital to which Patient was removed.
June 24	**Empress of France**	Quebec ...	Measles ... (2 cases)	... ...
June 25	**Orbita** ...	Valparaiso ...	Measles ...	... ...
June 26	**Jebba** ...	West Coast of Africa	Malaria ... (16 cases)	Royal Southern
June 28	**Melita** ...	Montreal ...	Measles ...	... ...
June 28	**Eboe** ...	West Coast of Africa	Malaria .. (6 cases)	... ...
June 29	**St. Stephen**...	West Coast of Africa	Malaria ... (11 cases)	... ...
June 29	**Celtic** .	New York ...	Phthisis ...	... ...
July 1	**Benedict** ...	Para ...	Enteric Fever	Royal Southern
July 2	**Berridale** .	West Coast of Africa	Malaria ... (7 cases)	... ...
July 3	**Desna** ...	Bahia ...	Phthisis ...	... ...
July 5	**Caronia** ...	New York ...	Small-pox ...	... ...
July 6	**City of Durham**	Glasgow ...	Scarlatina ...	Fazakerley ...
July 7	**Tafna** ...	Cuba . .	Enteric Fever	Northern ...
July 8	**Neebing** ...	Ardrossan ...	Enteric Fever	Fazakerley ...
July 10	**Conway** ... School Ship	In the River	Diphtheria ... (2 cases)	Mill Lane ...
July 12	**Minnedosa** ...	Montreal . .	Phthisis ...	... ...

REMARKS.

Two children had suffered during the voyage.

Six cases occurred amongst passengers during the home voyage.

Fifteen cases occurred during the voyage—three of these being landed at Sierra Leone, the others being removed to hospital on arrival in this Port, and the usual disinfection was carried out.

The patient was a child passenger who had suffered from Measles during the voyage.

Six of the crew suffered during the voyage, but had recovered on arrival in Liverpool.

All these cases occurred abroad during the passage. All were well on arrival.

The patient was a distressed British seaman who died on the homeward passage, the body being buried at sea.

The patient was removed to hospital on arrival in this Port, and the vessel and bedding disinfected.

The sickness occurred amongst the crew during the voyage.

The patient died and was buried at sea. The disinfection was carried out by the ship's surgeon.

The patient was a third class passenger who was landed at Halifax on the outward passage. The disinfection and vaccination was carried out by the Halifax authorities.

The patient, a second class officer, was removed to the City Hospital on arrival in this Port.

The patient, a seaman, was removed to hospital, and the vessel and bedding disinfected.

The patient, a seaman, was removed to hospital, and the usual disinfection carried out.

Two boys from this vessel were brought ashore and removed to the City Hospital, Mill Lane.

The patient, on arrival, proceeded to her home in Bristol.

Date 1920.	Name of Vessel.	Where from.	Nature of Sickness.	Hospital to which patient was removed.
July 12	**Elysia** ...	Bombay ...	Malaria ... (2 cases)	... ...
July 13	**Boma** ...	West Coast of Africa	Malaria ... (8 cases)	... ...
July 13	**Mercier** ...	Casa Blanca	Phthisis ...	Brownlow Hill Institution
July 13	**Prah**	West Coast of Africa	Malaria ... (9 cases)	... ...
July 13	**Benin** ...	West Coast of Africa	Malaria ... (3 cases)	... .
July 14	**Appam** ...	West Coast of Africa	Malaria ... (13 cases)	... ...
July 15	**Ebani** ...	West Coast of Africa	Malaria ... (23 cases)	... .
July 15	**Ascanius** ...	Brisbane ...	Broncho-Pneumonia	... ...
July 17	**Victorian** ...	Brisbane ...	Measles ...	Fazakerley ...
July 18	**Teutonic** ...	Constantinople	Measles ...	Fazakerley ...
July 19	**Ravenrock** ...	Bombay ..	Small-pox ... (?)	Port Sanitary...
July 19	**Asuncion de Larrinaga**	Cuban Ports for Manchester	Phthisis ...	... ...
July 20	**Matama** ...	Spain ...	Diphtheria ...	Mill Lane ...
July 20	**Keemun** ...	Colombo ...	Enteric Fever	... ...

REMARKS.

Two of the crew suffering from Malaria were left in hospital at Port Said.

The patients were eight of the crew who suffered during the voyage.

The patient was one of the crew, and was removed to hospital on arrival in the Port.

Nine members of the crew suffered during the voyage, and the usual disinfection was carried out.

One of the patients was landed at Axim. The others had suffered during the voyage.

Eight passengers and five members of the crew suffered during the voyage.

The patients were all members of the crew who had suffered from Malaria during the voyage.

The patient, the chief steward, proceeded to his home.

The patient was a child passenger who was removed to hospital on arrival in this Port.

The patient was a military lieutenant, and was removed to the City Hospital, Fazakerley.

This vessel arrived in the Port on the 19th July, with one of the crew, "Abdul Ali," a native fireman, suffering from Smallpox(?). He was removed from the vessel in the ship's boat to the Port Hospital, and disinfection of the vessel and re-vaccination of the crew, etc., carried out. A list of the names and addresses of all on board was obtained. Those living in the City were kept under daily observation, notice being sent to the authorities of destination in the case of those living outside the City boundaries. The sickness proved to be Chicken Pox.

The patient, a native seaman, proceeded with the vessel to Manchester.

The patient, the master's wife, was removed to the City Hospital, and the usual disinfection was carried out.

The pantry-boy, suffering from Enteric Fever, was landed at Marseilles.

Date, 1920.	Name of Vessel	Where from.	Nature of Sickness.	Hospital to which Patient was removed.
July 20	**Bata**	West Coast of Africa	Malaria ... (6 cases)	... ...
July 21	**Itajahy** ...	Montreal ...	Malaria ...	... ...
July 22	**Prahsu** ...	West Coast of Africa	Malaria ... (10 cases)	... ...
July 22	**Metagama** ...	Montreal ...	Pneumonia...	... ...
July 25	**Neebing** ...	Ardrossan ...	Enteric Fever	... ...
July 25	**City of Calcutta**	Bombay ...	Malaria ...	... ...
July 25	**Salaga** ...	West Coast of Africa	Malaria ... (20 cases)	... ...
July 25	**Monassir** ...	Valencia ...	Dysentery ...	... ...
July 27	**Corsican** ...	Montreal ...	Measles ...	... ...
July 27	**Canada** ...	Montreal ...	Diphtheria . (3 cases)	Fazakerley ...
July 28	**K. A. Victoria**	New York ...	Measles ...	Grafton Street
July 30	**Haverford** ...	Philadelphia	Measles ...	Grafton Street
July 31	**Ekari** ...	West Coast of Africa	Phthisis ... (2 cases)	Fazakerley ...
July 31	**Ekari** ...	West Coast of Africa	Malaria ... (2 cases)	Tropical School of Medicine, Pembroke Place
July 31	**Ekari** ..	West Coast of Africa	Influenza ...	Fazakerley ...

REMARKS.
Six of the crew suffered during the voyage.
The captain of this vessel had suffered from Malaria during the voyage.
Two passengers and eight of the crew had suffered during the voyage.
The patient, one of the crew (a steward), was removed to the Bootle Borough Hospital.
The captain of this vessel, having Enteric Fever, was removed to the Nursing Home, Upper Duke Street, and the usual disinfection was carried out.
One of the passengers had suffered during the home passage.
Four passengers and sixteen of the crew had suffered during the voyage.
The patient, a D.B.S., was convalescent on arrival—he came from hospital at Gibraltar.
The patient was left in hospital at Quebec.
The patients were three children, and on arrival at this Port were removed to the City Hospital. The vessel and bedding were disinfected.
Patient was removed to the City Hospital.
The patient, a child, was removed to the City Hospital.
One of the patients was removed to the Fazakerley Sanatorium, the other proceeding to home in Birmingham.
Both of these patients were removed, and the vessel and bedding disinfected.
The patient was removed to hospital.

Date, 1920.	Name of Vessel	Where from.	Nature of Sickness.	Hospital to which Patient was removed.
July 31	**City of Exeter**	Bombay ...	Plague (?) ...	... .
Aug. 2	**Caronia** ...	New York ...	Diphtheria ...	Mill Lane ...
Aug. 2	**Cowardin** ...	West Coast of Africa	Malaria (3 cases) ...	... ...
Aug. 3	**Ortega** ...	Valparaiso ...	Measles ...	... ...
Aug. 6	**Flaxmere** ...	West Coast of Africa	Malaria (3 cases) ...	... ...
Aug. 13	**Salaga** ...	West Coast of Africa	Malaria ...	... ...
Aug. 13	**Rabymere** ...	West Coast of Africa	Malaria (8 cases) ...	... ...
Aug. 16	**Badagri** ...	West Coast of Africa	Malaria (5 cases) ...	... ...
Aug. 18	**Zaria** ...	West Coast of Africa	Malaria ...	... ...
Aug. 18	**Patani** ...	West Coast of Africa	Malaria (4 cases) ...	... ...
Aug. 18	**Syrian Prince**	Alexandria ... for Manchester	Enteric Fever	... ...
Aug. 18	**Oranian** ...	Vera Cruz ...	Dysentery ...	... ...
Aug. 19	**Hildebrand** ...	South America	Measles ...	... ...
Aug. 19	**Onitsha** ...	West Coast of Africa	Malaria (20 cases) ...	... ...
Aug. 19	**Bhamo** ...	West Coast of Africa	Malaria (8 cases) ...	... ...
Aug. 19	**Bhamo** ...	West Coast of Africa	Dysentery ...	... ...

REMARKS.
A native saloon boy, who was landed at Suez on the outward passage. Radio message received later that case was negative.
The patient, one of the crew (a waiter), was removed to the City Hospital. and the usual disinfection carried out.
The patients were all members of the crew, who had suffered during the voyage.
The patient was landed at Plymouth, where disinfection was carried out.
Three of the crew suffered during the voyage.
The patient proceeded to his home in the City.
Eight cases occurred amongst the crew during the voyage.
Five of the crew suffered on the voyage.
A passenger suffered during the voyage.
Four of the crew had suffered during the voyage.
The patient was convalescent on arrival, and proceeded with the vessel to Manchester.
The patient was landed at Mobile.
Three children who were landed at Leixoes.
The patients were all members of the crew who had suffered during the voyage.
Eight of the crew suffered from the sickness.
A passenger suffered during the home passage.

Date 1920.	Name of Vessel.	Where from.	Nature of Sickness.	Hospital to which patient was removed.
Aug. 24	**Metagama** ...	Montreal ...	Erysipelas ...	... ...
Aug. 24	**Metagama** ...	Montreal ...	Phthisis	... ...
Aug. 24	**Barrymore** ...	Baltimore ...	Enteric Fever	... ...
Aug. 25	**Elmina** ...	West Coast of Africa	Malaria ... (3 cases)	... ...
Aug. 25	**Memnon** ...	Yokohama ...	Tuberculosis	... ...
Aug. 27	**Gera**	Java ...	Malaria ... (2 cases)	... ...
Aug. 27	**Burutu** ...	West Coast of Africa	Malaria . (12 cases)	... ...
Aug. 30	**Megantic** ...	Montreal ...	Diphtheria ...	Mill Lane ...
Sept. 2	**Teutonic** ...	Alexandria ...	Enteric Fever	... ...
Sept. 2	**Canada** ...	Montreal ...	Chicken-pox	Fazakerley ...
Sept. 3	**Viking** ...	Douglas ...	Enteric Fever	Fazakerley ...
Sept. 5	**Melita** ...	Montreal ...	Pneumonia...	... ...
Sept. 5	**Manzanares**	Kingston, Jamaica	Small-pox ...	Port Sanitary New Ferry
Sept. 5	**Darro** ..	South America	Pneumonia...	... ...

REMARKS.
The sickness occurred on the outward passage.
Patient proceeded to his home in Aberdeen.
The patient, a seaman, had gone to his home in Seaforth. The usual disinfection was carried out.
The cases occurred during the voyage.
The patient died and was buried at sea.
Both cases were landed abroad.
Twelve of the crew suffered during the voyage.
The patient, a passenger, was removed to the City Hospital, and the vessel and bedding disinfected.
The patient, a fireman, was landed at Alexandria.
The patient was removed to the City Hospital, and the usual disinfection was carried out.
A cabin boy from this vessel was removed to hospital from his home in the City.
The sickness occurred during the passage home.
This vessel arrived in the Port on the 5th September, and reported having one case of Smallpox on board. The patient, a fireman, who had been isolated in the wheel-house, aft, was removed from the vessel in the river by the ship's boat to the Port Hospital, New Ferry. Disinfection of the vessel, and vaccination of the passengers and crew, was carried out by the Port Sanitary Staff. A list of the names and addresses on board was obtained, and these were dealt with in the usual way.
The patient died and was buried at sea.

Date, 1920.	Name of Vessel	Where from.	Nature of Sickness.	Hospital to which Patient was removed.
Sept. 5	**Darro** ...	South America	Measles ... (5 cases)	Grafton Street
Sept. 7	**Chama** ...	West Coast of Africa	Malaria ... (5 cases)	... ...
Sept. 9	**Appam** ...	West Coast of Africa	Malaria ... (16 cases)	... ...
Sept. 15	**Empress of France**	Montreal ...	Malaria ...	... ...
Sept. 15	**Brescia** ...	Salonika ...	Enteric Fever (?)	Fazakerley ...
Sept. 20	**Barracoo** ...	West Coast of Africa	Malaria ... (11 cases)	... ...
Sept. 20	**Linmere** ...	West Coast of Africa	Malaria ... (9 cases)	... ...
Sept. 20	**Deseado** ...	Buenos Ayres	Phthisis ...	... ...
Sept. 20	**Deseado** ...	Buenos Ayres	Pneumonia...	... ...
Sept. 21	**Brescia** ...	Salonika ...	Enteric Fever (?)	Fazakerley ...
Sept. 21	**Explorer** ...	Calcutta ...	Enteric Fever (?)	... ...
Sept. 22	**Minnedosa** ...	Montreal ...	Scarlatina ... (2 cases)	... ...
Sept. 23	**Fabian** ...	Mombasa ...	Plague ... (?)	Port Sanitary, New Ferry

REMARKS

The patients, five children, were removed to the City Hospital, and the usual disinfection was carried out.

The patients were all members of the crew who suffered during the voyage.

Two of the crew and fourteen of the passengers suffered during the voyage.

The patient, a bell boy, ill on arrival, proceeded to his home in Liverpool.

A fireman, removed to the City Hospital from his home in Liverpool ; sickness proved to be non-infectious.

Eleven of the crew suffered during the voyage.

Nine of the crew suffered during the voyage.

The patient was a third class passenger, who was landed at Lisbon.

A passenger suffered on the voyage. The disinfection was carried out by surgeon of the ship.

A second fireman removed to the City Hospital from his home in Liverpool ; sickness proved to be non-infectious.

The patient was the chief officer, who was landed at Port Said. The disinfection was carried out at London.

Two children suffered on the outward trip. The disinfection was carried out at Montreal.

The vessel arrived in the Port 23rd September, 1920, from Beira, and was boarded by the Assistant Port Medical Officer. The patient, ship's carpenter, was found to be suffering with a Bubo, Plague being suspected. The patient was removed by ship's boat to New Ferry Hospital. Clothing was disinfected and quarters fumigated, and the vessel was allowed to dock the same tide. The usual precautions against the egress of rats was taken, and on completion of the discharge of cargo, the holds were fumigated and 118 rats killed thereby. Some 19 rats were trapped by the Authority's rat-catchers. None were found infected with Plague. The case proved not to be one of Plague.

Date 1920.	Name of Vessel.	Where from.	Nature of Sickness.	Hospital to which patient was removed
Sept. 24	**Egori** ...	West Coast of Africa	Malaria ... (5 cases)	... ...
Sept. 24	**Warri** ...	West Coast of Africa	Malaria ...	... .
Sept. 25	**Akabo** ...	West Coast of Africa	Malaria ... (13 cases)	... ...
Sept. 26	**Megantic** ...	Montreal ...	Diphtheria ...	Mill Lane ...
Sept. 26	**Megantic** ...	Montreal ...	Phthisis ...	... ...
Sept. 26	**Castalia** ...	Bombay ...	Malaria ...	... ...
Sept. 27	**Awa Maru** ...	Colombo ...	Enteric Fever (2 cases)	Fazakerley ...
Sept. 27	**Berriedale** ...	West Coast of Africa	Malaria ...	... ...
Sept. 28	**Baltic** ...	New York ...	Enteric Fever	Brownlow Hill Infirmary
Sept. 28	**Metagama** ...	Montreal ...	Scarlatina ... (2 cases)	Fazakerley ...
Sept. 28	**Metagama** ...	Montreal ...	Diphtheria ... (2 cases)	... ...
Sept. 28	**Metagama** ...	Montreal ...	Pneumonia ...	... ...
Sept. 29	**Ancobra** ...	West Coast of Africa	Malaria ... (14 cases)	... ...
Sept. 29	**Prinz F. Wilhelm**	Quebec ...	Phthisis ...	... ...
Oct. 4	**Boutry** ...	West Coast of Africa	Malaria ... (5 cases)	... ...
Oct. 5	**Corsican** ...	Montreal ...	Phthisis ...	... ...

REMARKS.
Five of the crew suffered during the voyage.
The patient, a carpenter, was suffering on arrival in this Port, and proceeded to his home in Liverpool.
Thirteen of the crew suffered during the voyage.
The patient was a third class passenger, who was removed to the City Hospital.
A ship's steward, who proceeded to his home in Bootle.
One patient, who was landed at Marseilles.
The patients, the chief and first engineers, were removed to the City Hospital. The vessel and bedding were disinfected.
One of the crew suffered during the voyage.
The patient was a fireman who was removed to hospital from Walton Gaol.
Two child passengers, who were removed to the City Hospital, and the usual disinfection was carried out.
Two cases occurred on the outward trip.
One case occurred on the outward trip.
Fourteen of the crew suffered from the sickness during the voyage.
A steward proceeded home to Orrell Park.
Five of the crew suffered during the voyage.
The patient, who was deported from Canada, proceeded to Church, Lancashire.

Date, 1920.	Name of Vessel	Where from.	Nature of Sickness.	Hospital to which Patient was removed.
Oct. 6	**Blue Triangle**	West Coast of Africa	Malaria ... (5 cases)	... ...
Oct. 7	**Tug Alfred** ...	In the River	Scarlatina ...	Fazakerley ...
Oct. 8	**Moliere** ...	Buenos Ayres	Enteric Fever	Fazakerley ...
Oct. 8	**Huberfels** ...	Galveston ...	Enteric Fever	... ...
Oct. 8	**Victorian** ...	Quebec ...	Phthisis ...	... ...
Oct. 9	**Polyphemus**	Colombo ...	Phthisis ...	... ...
Oct. 9	**Corsican** ...	Montreal ...	Enteric Fever	Royal Southern
Oct. 10	**Bonny** ...	West Coast of Africa	Malaria ... (3 cases)	... ...
Oct. 10	**Betwa** ...	West Coast of Africa	Malaria ... (3 cases)	... ...
Oct. 11	**Celtic** ...	New York ...	Tuberculosis (Intestinal)	... ...
Oct. 12	**Melita** ...	Montreal ...	Phthisis ... (2 cases)	.. ..
Oct. 15	**Oswestry** ...	West Coast of Africa	Broncho-Pneumonia	... ...
Oct. 16	**Orita** ...	South America	Phthisis ... (2 cases)	... ...
Oct. 16	**Mobile** ...	New York ...	Pneumonia...	... ...
Oct. 17	**Biafra** ...	West Coast of Africa	Malaria ... (4 cases)	... ...
Oct. 18	**Baltic** ...	New York ...	Phthisis ...	... ...

REMARKS
Five of the crew suffered on the voyage. One was landed at Brest; one died and was buried at sea.
The engineer was removed from his home to the City Hospital.
The patient, a trimmer, was removed from his home to the City Hospital.
The wireless operator died on nearing the Port.
The patient, a passenger, proceeded to Widnes.
The patient was a seaman who proceeded to his home in Liverpool.
The patient, a fireman, was removed to hospital, and the usual disinfection was carried out.
Three cases occurred during the voyage.
Three cases occurred during the voyage.
Infant passenger died during the voyage—body landed.
The patients proceeded to their homes in Glasgow and Birmingham.
The patient died during the voyage, and the body was landed at Sierra Leone.
The patient, a butcher, proceeded to his home in Liverpool; a second patient died on the 25th September.
A steward was removed to hospital.
Four of the crew had suffered during the voyage.
The patient, a nurse, proceeded to her home in Ireland.

Date, 1920.	Name of Vessel	Where from.	Nature of Sickness.	Hospital to which Patient was removed.
Oct. 18	**Patricia** ...	Bombay ...	Malaria ... (76 cases)	... ...
Oct. 19	**Demerara** ...	River Plate...	Pneumonia...	... ...
Oct. 20	**Aeneas** ..	China ...	Diphtheria ...	Fazakerley ...
Oct. 20	**Mount Snowdon**	Algiers ...	Enteric Fever	Fazakerley ...
Oct. 22	**Eric Maru** ...	Colombo ...	Malaria ..	Mill Road Infirmary
Oct. 23	**Eboe**	West Coast of Africa	Malaria ... (11 cases)	... ...
Oct. 24	**Hildebrand** ...	Manaos ...	Phthisis ...	... ...
Oct. 25	**Mount Snowdon**	Algiers ...	Pneumonia...	Garston ...
Oct. 25	**Macharda** ...	Glasgow ...	Small-pox ... (?)	Port Hospital New Ferry
Oct. 26	**Benin** ...	West Coast of Africa	Malaria ... (5 cases)	... ...
Oct. 26	**Zaria** ...	West Coast of Africa	Malaria ... (4 cases)	... ...
Oct. 26	**Ekari** ...	West Coast of Africa	Malaria ... (5 cases)	... ...
Oct. 26	**Boma** ...	West Coast of Africa	Malaria ... (10 cases)	... ...

REMARKS.

The cases all occurred amongst troops during the passage from India.

The patient, a second class passenger, died on the homeward passage.

The patient, a fireman, was removed to the City Hospital, and the vessel and bedding disinfected.

The second engineer, who was suffering from Enteric Fever, was removed from his home in Walton to the City Hospital.

The patient was admitted into the Institution Hospital, Mill Road.

Eleven cases occurred amongst the crew during the voyage.

The patient proceeded to his home in Devon.

The patient, a cook, was removed to Garston Hospital.

A Lascar seaman was removed to the Port Hospital for observation. The sickness proved to be Chickenpox. Vaccination of the crew, disinfection of the vessel and effects carried out.

Five cases occurred amongst the crew during the passage.

Four passengers suffered during the home passage.

The cases occurred amongst the crew during the passage.

Ten of the crew had Malaria during the voyage; all well on arrival.

Date 1920.	Name of Vessel.	Where from.	Nature of Sickness.	Hospital to which Patient was removed.
Oct. 29	**Antwerpen** ...	Canada ..	German Measles	Fazakerley ...
Oct. 30	**Bonny** ...	West Coast of Africa	Malaria ..	... ...
Oct. 30	**Prahsu** ...	West Coast of Africa	Malaria ... (6 cases)	... ...
Oct. 30	**Clematis** ...	West Coast of Africa	Malaria ... (3 cases)	... ...
Nov. 1	**Orbita** ...	Valparaiso ...	Enteric Fever	... ...
Nov. 1	**Orbita** ...	South America	Chicken-pox	.. ..
Nov. 2	**Metagama** ...	Montreal ...	Chicken-pox	... ...
Nov. 4	**Victorian** ...	Quebec ...	German Measles	Fazakerley ...
Nov. 5	**Metagama** ...	Montreal ...	Diphtheria ...	... ...
Nov. 6	**Prah** ...	West Coast of Africa	Malaria ... (3 cases)	... ...
Nov. 6	**Albatross** ..	Benisaf ...	Malaria ...	... ...
Nov. 6	**Ada**	Rio Grande...	Pneumonia...	Royal Infirmary
Nov. 8	**Canada** ...	Montreal ...	Measles ... (2 cases)	... ...

REMARKS

The patient was removed to the City Hospital.

One of the crew had Malaria during the voyage.

Six of the crew suffered during the voyage ; all well on arrival.

The chief officer died at Lagos, and two members of the crew suffered on the voyage.

The patient, a fireman, was landed at Valparaiso on the outward passage.

The patient, a first class passenger, had recovered on arrival in this Port.

The patient was left abroad, where disinfection was carried out.

The patient was removed to the City Hospital.

A stewardess, who arrived by this vessel, developed Diphtheria at her home in Neston.

Three of the crew had Malaria during the voyage.

One of the crew suffered during the passage.

The patient was admitted into the Royal Infirmary.

The patients were landed at Grosse Island during the outward passage

Date, 1920.	Name of Vessel	Where from.	Nature of Sickness.	Hospital to which Patient was removed.
Nov. 8	**Canada** ...	Montreal ...	Chicken-pox	... ...
Nov. 10	**Pungo** ..	Jamaica ...	Enteric Fever (?)	Fazakerley ...
Nov. 15	**Melita** ...	Montreal ...	Pneumonia...	Brownlow Hill Institution Hospital
Nov. 16	**Palma** ...	West Coast of Africa	Malaria ... (9 cases)	... ...
Nov. 16	**Ortega** ...	West Coast of S. America	Erysipelas ...	... ...
Nov. 16	**Ortega** ...	South America	Phthisis ... (2 cases)	... ...
Nov. 16	**Ortega** ...	South America	Pneumonia... (2 cases)	... ...
Nov. 17	**Flaxmere** ...	West Coast of Africa	Malaria ... (2 cases)	... ...
Nov. 19	**Conejas** ...	Freetown ...	Malaria ... (20 cases)	... .
Nov. 20	**Akabo** ...	West Coast of Africa	Malaria ... (8 cases)	... ...
Nov. 20	**Chindwin** ...	Rangoon ...	Pneumonia..	... ...
Nov. 20	**Modwa** ...	Antwerp ...	Malaria ... (2 cases)	... .
Nov. 23	**Clan Macbeth**	Calcutta ...	Dysentery ...	... ...

REMARKS.

This patient was also landed at Grosse Island.

The patient, an apprentice, was removed to the City Hospital. Sickness proved to be non-infectious.

The patient, a passenger, was removed to hospital.

The cases occurred amongst the crew during the voyage.

One of the crew, a fireman, had suffered during the voyage.

One of the patients, a seaman, proceeded to his home in Bootle; the other, also a seaman, proceeded to the Royal Naval Hospital, Chatham.

One of the patients, a fireman, was landed at Bilbao; the other had recovered on arrival in this Port.

Two of the crew had suffered from Malaria during the voyage.

The cases all occurred amongst the crew during the voyage.

Seven of the crew and one passenger had Malaria during the voyage.

The patient was landed at Aden.

Two of the crew had suffered from Malaria during the voyage.

The patient, a Lascar seaman, was left in hospital at Glasgow.

Date 1920.	Name of Vessel.	Where from	Nature of Sickness.	Hospital to which Patient was removed.
Nov. 25	**Salaga** ...	West Coast of Africa	Malaria ... (11 cases)	... ...
Nov. 26	**West Uacha**	Yokohama ...	Malaria ... (4 cases)	. ...
Dec. 1	**Strabo** ..	Buenos Ayres	Tuberculosis	... ...
Dec. 1	**Minnedosa** ...	Montreal ...	Measles ...	Grafton Street
Dec. 1	**Minnedosa** ...	Montreal ...	Pneumonia...	Northern ...
Dec. 3	**Badagri** ...	West Coast of Africa	Malaria .. (13 cases)	... ...
Dec. 3	**Carmania** ...	New York ...	Measles ...	... ...
Dec. 6	**Deseado** ...	Buenos Ayres	Tuberculosis	... ...
Dec. 7	**Olympia** ...	Bombay ...	Dysentery ...	Brownlow Hill Institution Hospital
Dec. 8	**Metagama** ...	Montreal ...	Pneumonia... (2 cases)	Brownlow Hill Institution Hospital
Dec. 8	**Metagama** ...	Montreal ...	Scarlatina ...	Netherfield Road
Dec. 14	**Karnak** ...	Constantinople	Enteric Fever (?)	Fazakerley ...
Dec. 18	**Itajahy** ...	West Coast of Africa	Malaria ... (2 cases)	... ...

REMARKS.
Eleven cases occurred amongst the crew during the voyage.
All members of the crew who suffered during the voyage.
The patient, a Negro fireman, proceeded to his home.
A child passenger was removed to hospital.
The patient, a fireman, was removed to hospital.
The cases all occurred amongst the crew during the voyage.
The sickness occurred on the outward voyage to New York.
The patient died and was buried at sea. Vessel disinfected by the ship's surgeon.
The patient, a Lascar seaman, was admitted into hospital.
Both cases were removed to hospital
The patient a second class passenger, was removed to the City Hospital. The vessel and bedding were disinfected.
The patient, a cook, was removed to the City Hospital, and the usual disinfection was carried out. The sickness proved to be non-infectious.
Both of these cases occurred during the voyage.

Date, 1920.	Name of Vessel.	Where from.	Nature of Sickness.	Hospital to which Patient was removed.
Dec. 19	**Melita** ...	St. John's ...	Measles ...	... ...
Dec. 19	**Melita** ...	St. John's ...	Small-pox ... (?)	Port Sanitary New Ferry
Dec. 22	**Oakmere** ...	West Coast of Africa	Malaria ... (12 cases)	... ...
Dec. 22	**Zaria** ...	West Coast of Africa	Malaria ... (4 cases)	... ...
Dec. 22	**Onitsha** ...	West Coast of Africa	Malaria ... (31 cases)	... ...
Dec. 23	**City of Baroda**	Bombay ...	Pneumonia...	... ...
Dec. 23	**Patani** ...	West Coast of Africa	Malaria ... (3 cases)	... ...
Dec. 23	**Empress of Britain**	Montreal ...	Scarlatina ...	... ...
Dec. 28	**Bata**	West Coast of Africa	Malaria ... (17 cases)	... ...
Dec. 28	**Patani** ...	West Coast of Africa	Small-pox ...	... .
Dec. 28	**Patani** ...	West Coast of Africa	Malaria ...	... ...
Dec. 30	**Benue** ...	West Coast of Africa	Malaria ... (3 cases)	... ...
Dec. 31	**Thomas Holt**	West Coast of Africa	Malaria ... (4 cases)	Tropical Ward Royal Infirmary

REMARKS

The patient, a child third class passenger, had suffered during the voyage.

The patient, a third class passenger, was removed from the vessel in the river per the ship's boat to the Port Hospital for observation. The sickness proved to be Chickenpox.

The cases occurred amongst the crew during the voyage.

Four of the crew had Malaria during the voyage.

Thirty-one cases had occurred amongst the crew during the voyage.

The patient, a native fireman, died and was buried at sea.

Three cases occurred amongst the crew during the voyage.

The case occurred on the outward passage. Disinfection was carried out at St. John's.

The cases all occurred amongst the crew during the voyage.

The patient, a native deck passenger, was landed at Accra, where disinfection was carried out.

The case was landed at Sierra Leone.

Three of the crew suffered during the voyage.

Two of the patients were removed to hospital. The other two patients had recovered on arrival.

Diseases incident upon Sailors.—Sanitation of Vessels.

The diseases to which sailors are peculiarly liable may be classified under four headings:—

(*a*) Those which are caused by the peculiar stresses of the work.

(*b*) Those attending the vices to which sailors in foreign ports are particularly liable to be attracted. Alcoholism and Venereal Disease.

(*c*) Tropical Disease, including Malaria, Beri-beri, etc.

(*d*) Those associated with the peculiar environment of the sailor such as damp forecastles, contaminated water supplies and close association of the sick with the healthy in the confined quarters on shipboard.

It is against the latter classes of disease that the efforts of the Port Sanitary Authority for improving the sanitation of vessels are directed.

The defects are classified under three headings as arising from—

(*a*) Faulty construction;

(*b*) Wear and tear;

(*c*) Lack of cleanliness and nuisance.

From the table on page 93 it will be seen that of the defects discovered 1·08 per cent. arise under (*a*), 6·88 per cent. under (*b*), and 92·04 per cent. under (*c*). The large number of defects included under the third heading is due to the fact that British crews when paid off in this Port almost invariably leave their quarters in a dirty condition. While dirty the quarters are uninhabited, but it is the duty of the Port Sanitary Authority to see that they are thoroughly cleansed before the ship sails again. This work is always carried out satisfactorily by the shore gangs of the various shipping companies. The remedy for the constant recurrence of this nuisance does not lie with the Port Sanitary Authority. Apart from carelessness on the part of the men there are problems connected with the trouble which are outside the sphere of Port Sanitary Administration. Among the difficulties in improving crew accommodation in ships are the expense, the taking up of cargo space, and the consequent diminished earning capacity of a ship. Here at least is one way in which money might be saved towards improving conditions for the crew. The annual expense of cleaning, painting and repairing of crew's quarters every time the ship comes home must be enormous, and should not be necessary. Moreover, the greater the respect with which sailors will treat the accommodation they receive the more encouragement they will give and the more they will strengthen the hands of those who are working for better conditions for them. This is surely a question worthy of careful consideration between shipping companies, trades unions and the Board of Trade.

WORK OF THE PORT SANITARY INSPECTORS.

The area of the Port is divided into four districts, those of the North Docks, the North Central Docks, the South Docks and the outlying districts, comprising Birkenhead and Garston. These are each in charge of an Inspector who visits all vessels lying within his district to examine into their sanitary state and also to enquire concerning the health of those on board and as to the occurrence of sickness during the voyage, particularly stringent enquiries being made in the case of all vessels from ports where Plague, Cholera and Smallpox are prevalent. Enquiries are also made as to the occurrence of sickness or mortality amongst the rats on vessels, and one and a half days per week are devoted by each Inspector to conditions likely to afford harbourage for rats in his area of the dock estate.

In addition to the daily routine inspection of the sanitation of vessels special visits require to be made to many vessels in respect of sickness. Smallpox contacts have to be kept under daily observation. Disinfection has to be carried out or supervised on all vessels which have had cases of actual or suspected infectious disease on board. Inspectors also supervise the fumigation of the holds of vessels for the destruction of rats when certificates of fumigation are required by foreign sanitary authorities. The whole time of one Inspector has been occupied in supervising the landing of cattle from coastwise cattle boats.

By rotation the Sanitary Inspectors spend a month each on Tidal Duty. This work consists in attending at the Port Sanitary Office for three hours before and one hour after high water each tide in order to receive information regarding the arrival of vessels requiring to be visited by the Medical Officer, to communicate information to the Medical Officer, and arrange for the boarding launch, and to assist when necessary in the removal of infectious cases to hospital.

INSPECTION OF SHIPPING.

Year 1920.

TABLE 10.

Nationality.	Visits.	Re-visits.	Total.
British	2,932	1,123	4,055
Norwegian ...	108	53	161
Swedish... ...	55	18	73
Spanish... ...	114	168	282
Danish	23	18	41
Japanese ...	29	21	50
Italian	7	5	12
Portuguese ...	8	3	11
Russian... ...	8	7	15
French	26	6	32
Dutch	23	6	29
Greek	12	5	17
American ...	129	61	190
Belgian ...	4	1	5
Chilian	2	3	5
Esthonian ...	2	3	5
Finn	2	2	4
Lettish	1	—	1
Uruguayan ...	3	—	3
Brazilian ...	1	3	4
Peruvian ...	4	4	8
Total ...	3,493	1,510	5,003

SUMMARY OF INSANITARY CONDITIONS.

TABLE 11.

Class of Vessels.	Number Inspected.	Number on which nuisances were found.	Per cent.
FOREIGN—			
Steamers	2,298	701	30·50
Sailing	12	3	25·00
Total...	2,310	704	30·47
COASTWISE—			
Steamers	1,091	66	6·05
Sailing	92	1	1·08
Total...	1,183	67	5·66

Nationality.	Number Inspected.	Number on which Nuisances were found.
British	29,32	715
Foreign	561	56
	3,493	771

Nuisances arising through

Defects of Orginal Construction. (*a*)	Per cent. of Total Defects.	Structural Defects through wear and tear. (*b*)	Per cent. of Total Defects.	Dirt, and other conditions prejudicial to health.	Per cent. of Total Defects (*c*)
30	1·08	191	6·88	2,555	92·04

(See Table 11a).

Canal Boats.

The Port Sanitary Inspectors have been appointed Canal Boat Inspectors under the Canal Boats Acts 1877 and 1884. This is rendered necessary by the large number of Canal Boats which are to be found lying in the Liverpool Docks. By rotation, one Inspector devotes one whole day per week for a period of five months at a time to this work, as it has been found that in this way it is easier to follow up any boat that may be defective. These boats are for the most part kept in very good repair.

621 boats were inspected during the year, of which number 37 were found to have some condition contravening the regulations.

Water-closet Accommodation on the Dock Estate.

During the year special attention has been paid to the water-closet accommodation on the Dock Estate. The number of seats provided is considered to be sufficient for the average number of men working except in the case of certain graving docks. The attention of the Mersey Docks and Harbour Board has been drawn to the deficiencies and increased accommodation of excellent type is now being provided where required. A great amount of work has also been done by the Mersey Docks and Harbour Board in cementing rough brickwork in certain of the closets where the walls were likely to be fouled. There is now provided a smooth impervious surface which can be readily cleansed by flushing with a hose pipe.

While varying considerably in detail according to situation and time of construction the W.C.'s in the Dock Estate can be divided into two types:—

(1) *Modern Automatic Flushing Type* consisting of seats situated over a shallow trough of glazed stoneware. These closets are flushed automatically every hour from a cistern of about 30 gallons capacity.

(2) *Older Types* flushed daily by men specially employed to keep these closets clean. These older types vary considerably. They consist of a brick trough, cement lined usually, some 4ft. deep, though some are only 2ft. and a few are as much as 8ft. deep.

TABLE 11a.

THE FOLLOWING TABLE SHOWS THE NUMBER AND NATIONALITIES OF THE VESSELS ON WHICH DEFECTS WERE DETECTED DURING THE YEAR 1920.

NATIONALITY.	Number of Ships.	Dirty Forecastles	Dirty Wash-houses, Store-houses, etc.	Foul Water Casks.	Foul Bilges.	Foul W.C.'s.	Accumulations of offensive refuse.	Gear stowed in Crew's Quarters.	Damp Quarters.	Water lodging on top of Forepeak Tank.	Animals kept, causing nuisance.	Leaky Decks overhead.	Defective Stoves.	Defective Bulkheads.	Defective Ports and Sky-lights.	Defective Ventilators.	Defective Flooring Boards	Defective Hatches and Lockers.	Defective Chain Pipes.	Defective Hose Pipes.	Defective W.C. Fittings.	Defective Soil Pipes.	Inadequate Ventilation.	Inadequate Lighting	Inadequate Drainage.	Bare Iron not Sheathed	W.C.'s deficient in Ventilation and situation bad.	Total number of Defects.	Total Remedied.
British ...	715	1954	45	4	...	376	16	2	16	1	...	42	5	14	76	2	...	9	7	10	12	1	7	2	4	1	12	2618	2464
Norwegian ...	17	31	...	...	...	14	...	...	...	...	...	...	...	...	...	...	2	...	...	...	...	...	1	...	1	...	...	49	47
Swedish ...	6	12	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	12	12
Spanish ...	9	16	2	...	...	3	1	...	2	...	...	...	1	...	2	...	..	...	...	...	...	...	...	2	...	. .	...	29	27
Belgian ...	1	4	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	4	4
Japanese ...	3	8	...	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	9	9
Italian ...	2	...	...	...	...	2	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	2	2
Greek ...	1	...	...	...	...	2	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	2	2
Dutch	2	2	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	2	...	...	...	...	...	...	4	4
American ...	4	4	2	...	...	...	2	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	8	8
French ...	4	8	3	...	...	4	1	...	2	...	...	2	...	...	...	...	...	...	...	...	...	...	...	..	...	...	...	20	16
Russian ...	2	2	...	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	..	...	...	...	3	3
Peruvian ...	3	4	...	2	...	1	...	...	...	...	...	2	...	...	...	...	...	...	...	...	2	...	...	...	...	...	...	11	11
Lettish ...	1	1	...	...	...	...	...	...	...	...	...	...	...	..	...	...	...	...	...	...	...	...	...	...	...	...	...	1	1
Uruguayan ...	1	2	...	...	...	...	2	...	...	...	...	...	...	. .	...	...	...	...	...	...	...	...	...	...	...	...	...	4	4
Total ...	771	2048	52	6	...	402	24	2	20	1	...	46	6	14	78	2	2	9	7	10	16	1	8	4	5	1	12	2776	2614

In some of them a certain amount of water is retained in the trough by a weir at one end, in others the trough is dry. In some the trough is flushed by opening a valve and allowing from 100 to 150 gallons of water to rush through from a large cistern, in others a sluice is lowered at one end of the trough, which is then filled with water; the sluice is subsequently opened and everything is carried away by the great rush of water. In all cases the seats and the interior walls back and front of the closets, as well as the cement floor, are swilled daily with a hosepipe at the time the trough is flushed, the whole place being perfectly sweet and clean after this has been done.

A number of men are employed by the Dock Board solely to keep these closets clean. Each man has from 12 to 15 closets to flush in the course of the day. If it becomes necessary on account of more men being employed on a quay or of exceptionally hot weather, these closets are flushed more frequently.

Conclusions in regard to W.C.'s on the Dock Estate.

Undoubtedly the automatic flushing closet is the ideal type in so far as it provides for the frequent removal of excreta. But it has many disadvantages Frost or accident to the mechanism may stop the flushing altogether, and the careless throwing of bulky articles into the trough will obstruct the force of the water and prevent proper cleansing. The amount of water used is very great unless it is turned off at night and on again in the morning, in which case this type of closet will involve as much labour as the older type.

Of the older types the trough 8ft. deep or so is undoubtedly condemned because of the fouling of the interior walls which cannot be properly cleansed. But those with troughs 2ft. to 4ft. deep have many advantages. They are economical in water consumption, and yet the flush is so powerful, the trough is so wide and with so steep a fall that none of the many extraordinary articles that find their way into these closets can stem the tide.

If required at any time the closets can be flushed more frequently than once per day, and if a closet is not in use for a time flushing can be discontinued. All the new closets being erected are of the automatic flushing type, but until these are treated with proper respect it cannot be recommended that the older types should everywhere be replaced by modern conveniences.

In regard to light and ventilation, this is generally sufficient, though there are a few instances where lighting has suffered in order that privacy may be obtained.

Aliens.

The Aliens Order, 1919, came into operation on 1st April, 1920, the medical examination of Aliens being carried out by the Assistant Port Medical Officers.

The object of the medical examination is the exclusion of those aliens

(1) whose presence is likely to be a danger to the health of this country;

(2) who are likely to become a charge upon public funds either by reason of their existing or probable future incapacity to support themselves and their dependents or because their condition is such as to render it probable that they will need treatment and care which they are unable to provide from their own resources.

There has been much discussion in regard to the provision of rooms on shore for the examination. A scheme for adapting certain waiting-rooms at Riverside Station has been abandoned, firstly, because it is essential for the satisfactory working of the Act that Medical Officers and Immigration Officers should be in close co-operation and this could not be attained with the Immigration Officers on the ship at the Landing Stage and the Medical Officer in Riverside Station, and, secondly, the safe custody of the Aliens whilst being transferred from the ship to the medical examination rooms presented considerable difficulties. The ideal scheme is the provision of sufficient accommodation on the Landing Stage to enable the Immigration Officers to conduct their examination there, a suitable room being provided in the same building for the detailed medical examination of aliens coming to this country for three months or more. Under such circumstances the work could be done most efficiently and most expeditiously with great saving of time not only to the Immigration Officers, but also to the Shipping Companies. Unfortunately the cost of erecting such buildings would be enormous and such a scheme cannot be carried out at present.

Meanwhile the medical examination has to be conducted on board under somewhat adverse conditions, chief among which are the noise, the poor light and the difficulty of keeping in touch with Immigration Officers working in different parts of the ship.

The largest passenger vessels arrive from U.S.A., Canada, South America, India and West Coast Africa. In addition smaller vessels arrive with a few passengers from all parts of the world. The larger vessels usually come to the Landing Stage, but sometimes have to be visited by tender while lying in the river or they may even run straight into dock. The smaller vessels are always dealt with either by tender or in dock. As a result the hours of work of the Medical Inspectors are much more irregular than is the case at ports dealing only with cross-channel passenger traffic. Though the greatest number of aliens arrive during the summer months the hours spent by the Medical Inspectors in this part of the work are at least as many in the winter as in the summer because of the delay and uncertainty due to fog and stormy weather.

The restrictions imposed by the Ministry of Labour on aliens desiring to take up employment in this country have been in operation during the year. As a result few aliens arrive to seek permanent residence in this country and therefore very few require examination as to their earning capacity. The great majority of Aliens arriving are visitors coming here for business, travel or to see their relations in this country. They have to be examined for disease likely to affect the Public Health, but conditions affecting earning capacity do not enter into the question. This fact accounts for the small number of rejections and conditional landings. If Aliens were free to come to this country to take up employment the work of the Medical Inspectors would be considerably increased.

The transmigrants passing through from America to Europe are a very different class from those travelling in the opposite direction. They have learned habits of cleanliness, and moreover they are for the most part those who have made good in America. There is little fear of the importation of disease into this country from this source.

TABLE SHEWING THE NUMBER OF PASSENGERS LANDED IN THE PORT OF LIVERPOOL DURING THE YEAR 1920.

From Ports outside Europe—		
British	80,086	
Aliens	52,969	
		133,055
From Ports inside Europe—		
British and Alien		3,697
Total Passengers landed		136,752

During the nine months (April 1st to December 31st) during which the Aliens Order of 1919 was in operation, 1,601 Aliens were subjected to detailed medical examination, 1,586 being passed, 12 conditionally landed, and 3 totally rejected.

Verminous Persons.

Facilities for the cleansing and disinfection of verminous persons and their belongings have been arranged for by the Port Sanitary Authority.

The bathing of these persons has been carried out at the Netherfield Road and Sparrow Hall Hospitals where an ample number of baths are available. The disinfectors of the hospitals, which are of large size, are, if necessary, utilised for the destruction of vermin in the clothing and belongings of these persons. As a rule, the alien immigrants and transmigrants arriving in the Port of Liverpool on inward bound vessels are in a clean condition and do not require the cleansing referred to.

The presence of typhus, which is a vermin transmitted disease, in Poland and in the neighbouring Continental countries, has caused the Ministry of Health and also American Health Authorities to view with some concern the arrival of emigrants and transmigrants in this country en route to America. These persons arrive in Liverpool from Dantzig, Hamburg, Antwerp, Rotterdam, Basle and Finland. The routes followed are:—

From Dantzic via Hull and London.

From Antwerp via London and Grimsby.

From Finland via Hull and Newcastle.

There are also direct services of steamers from the Continent to U.S.A. and Canada. The classes of transmigrant are mostly domestic servants and agricultural labourers. The nationalities are Russian, Polish and Austrian Jews, Russians, Polaks, Jugo-Slavs, Austrians, Hungarians, Finns and Scandinavians.

The emigration houses in which these people are housed pending the sailing of the vessel are kept under strict supervision; they are visited daily and all cases of infectious illness promptly reported to the Company's doctor and the Local Health Authority. The bedding is also constantly examined and attention is given to the occupation of the rooms to prevent overcrowding and to ensure cleanliness. In view of the prevalence of typhus in Poland and neighbouring countries, the Medical Officer of Health, at the request of various shipping companies acting under the instructions of the American Consul, has made arrangements for certain Polish and other emigrants to be bathed and their effects disinfected. Attention has been drawn to the value of "Derbac" soap in cleansing the hair in necessary cases amongst intending emigrants. Experiments have been made with the soap by the Department with promising results. These tests are being continued. This work is carried out at the Netherfield Road and Sparrow Hall Hospitals, where the special steam disinfectors have been made use of. The cost of the disinfection is defrayed by the shipping company concerned.

Supervision of Food Importations.

The work of supervising the food imported into the Port of Liverpool during the year has been carried out in a very satisfactory manner. Officials and importers endeavour to meet the circumstances of each case arising for consideration with the utmost harmony. Considering the enormous quantity and value of the food imported at Liverpool, the absence of any friction points to the careful and efficient administrative work which is being carried out.

The food inspection staff is now at its full strength, and consists of a Chief Inspector, who is assisted by a deputy chief and five inspectors, who give their whole time to the work.

The examination carried out by the inspectors consists of the sampling of portions of the various consignments of food which are recorded on the ship's manifest, and are landed on the quays and, in some cases, sent to warehouse or cold store. Packages may be required to be opened and the contents exposed for full inspection.

Under the unsound Food Regulations there are three methods of procedure laid down for dealing with food found to be unsound or unwholesome.

1. When the food is obviously unsound and no further examination is necessary, the importers or owners usually voluntarily surrender or remove the goods for immediate destruction under the supervision of the Port Sanitary Authority's officials.

2. The unsound food may be of such a character that the question of its industrial utilisation must be considered, e.g., certain meats or fatty materials may be utilised for soap, tallow, or manure manufacture, and arrangements are therefore made with the importers or owners to have the goods removed to premises where, under the supervision of the Port Medical Officer of Health, the goods may be properly disposed of for industrial purposes, to his entire satisfaction.

3. Where any difference of opinion arises in regard to the condition of certain imported foods, or as to their disposal, provision is made for an application to be made to a magistrate for his adjudication.

During the year the food inspection work has been very arduous, and many consignments of frozen meat and other foods were landed in an unsound condition, and required careful examination and supervision. Large quantities were sold for boiling down purposes.

A new company has commenced trading between Liverpool and Drogheda, importing fresh beef, poultry, eggs, &c., all of excellent quality, and arriving in good condition. A firm in Wexford has also begun to send weekly shipments of Irish produce. A point in favour of bringing sides of beef in preference to live cattle is that no matter how rough the passage may be, the beef will not be bruised.

The huge quantities of mutton and lamb which had accumulated in Australia and New Zealand during the war are now getting worked down, and there is evidence of this in the fewer shipments of mouldy and black spot mutton and lamb.

A large consignment of " Jack " rabbits was imported from the U.S.A. These were kept in store for about twelve months ; there was difficulty in disposing of these commercially, and they were eventually disposed of for manurial purposes.

A large consignment of boneless sides of mutton, which were rolled, frozen and packed in bags, arrived from South America. After de-frosting a percentage of this parcel it was found that a very large number had small abscesses in many of the lymphatic glands due to a disease epizootic—lymph-adenitis. The occurrence of these diseased glands necessitated the examination of each piece. The diseased portions were boiled down for the manufacture of tallow.

A few consignments of boneless beef are still brought to this Port, but de-frosting and detailed examination is still enforced.

Large quantities of frozen rabbits, belonging to the Ministry of Food, have been examined during the year. These goods have, in many instances, been in store over two or three years, and large quantities have had to be destroyed on account of mould, black spot, and decomposition.

A consignment of tinned peas from Naples was exported under conditions arranged by the Medical Officer of Health and the British Consul at Naples. The reason for exportation was the presence of an unusual and unnecessary amount of copper sulphate in the peas, which had been added to give the peas a bright green and fresh-looking appearance. The consignment averaged 3·4 grs. of copper sulphate per pound, some of the tins showed amounts up to 5 grs.

A glance at the tables appended will show the amounts of meat and allied foods condemned during the year.

A consignment of fruit pulp from Australia, packed in thin petrol tins, was found upon arrival to be almost totally unsound, the tins having rusted and in many cases burst. The whole consignment was destroyed at the request of the owners.

The condition of the Valencia oranges which arrived in the beginning of the year was not good; large quantities were held up on the quays and sorted. One notable cargo from the s.s. "Sirrah" consisted of 40,000 packages; the greater portion of this cargo was examined, and over 900 tons of decomposing fruit were destroyed.

American, Canadian and Virginian apples, as a rule, arrived in very good condition. No Australian or Tasmanian apples arrived in Liverpool during the year—these were all landed at Hull, London, Avonmouth, &c.

Several parcels of dried fruits, e.g., currants, prunes and raisins, which were in faulty condition, were re-conditioned before they were finally passed as suitable for food.

The imports of green fruit during the year were as follows:—

Sicily and Naples	Oranges and Lemons	195,323 pkgs.
Malaga	,, ,,	49,733 ,,
Murcia	,, ,,	138,971 ,,
Jaffa	,, ,,	209,230 ,,
Valencia	Oranges	62,843 cases.
,,	,,	692,415 h-cs.
Canada and America	Apples	508,812 brls.
,, ,,	,,	635,884 bxs.
Canary Island	Tomatoes	468,429 bdls.
,, ,,	Bananas	1,096,691 crts.
Jamaica	,,	1,923,108 bnchs.
Almeria	Grapes	332,082 brls.
Egypt	Onions	133,933 bags.
Valencia	,,	679,478 cases.

A large proportion of the oranges were landed at the Birkenhead docks, whilst all the Jamaica bananas were landed at Garston Docks.

TABLE 12.

SHOWING THE NUMBERS OF CATTLE, SHEEP, AND SWINE EXPORTED FROM IRELAND TO LIVERPOOL DURING THE YEAR 1920, AND SHOWING THE PORTS IN IRELAND AT WHICH THE ANIMALS WERE SHIPPED.

	Cattle.	Sheep.	Swine.
Belfast	5,583	7,769	—
Cork	36,371	14,714	4,446
Drogheda	39,547	55,966	1,098
Dublin	111,040	170,912	12,993
Dundalk	19,479	36,661	3,208
Londonderry	5,358	14,823	344
Newry	5,127	18,402	1,102
Sligo	520	1,430	4,842
Waterford	28,849	19,919	3,461
Total	251,874	340,596	31,494

TABLE 13.

SHOWING THE TOTAL NUMBERS OF THE SEVERAL KINDS OF CATTLE, SHEEP AND PIGS EXPORTED FROM IRELAND TO LIVERPOOL DURING THE YEAR 1919.

CATTLE.	No.	SHEEP.	No.
Fat	222,739	Fat	153,558
Stores (for fattening)	18,746	Stores	...
Milch Cows	4,341	Lambs	187,038
Springers	27		
Calves	6,021	Total Sheep	340,596
Total Cattle	251,874	PIGS.	
		Fat	31,351
		Stores	143
		Total Swine	31,494

TABLE 14.

STATEMENT SHOWING THE NUMBER OF LIVE CATTLE, &c., LANDED AND SLAUGHTERED AT THE FOREIGN ANIMALS WHARF (BIRKENHEAD, ALFRED AND WALLASEY LAIRAGES) DURING THE YEARS 1905 to 1920 INCLUSIVE.

Year.	Landed.				Slaughtered.			
	Oxen.	Calves.	Pigs.	Sheep, Lambs and Goats.	Oxen.	Calves.	Pigs.	Sheep, Lambs and Goats.
1905	276,725	5	—	160,105	276,273	4	—	163,705
1906	270,853	5	—	94,948	270,245	5	—	95,250
1907	214,061	2	—	97,688	215,821	2	—	94,714
1908	180,283	—	—	76,334	179,872	—	—	79,315
1909	148,233	2	—	8,053	147,812	2	—	8,053
1910	89,613	3	—	304	90,430	—	—	304
1911	78,232	2	—	40,338	79,215	1	—	39,314
1912	19,167	—	—	14,251	19,167	—	—	14,251
	143,114	**819**	**69,016**	**335,291**	**140,854**	**810**	**67,586**	**334,880**
1913	3,482	—	—	—	3,482	—	—	—
	351,276	**930**	**104,274**	**449,344**	**90,857**	**174**	**15,498**	**131,241**
1914	—	—	—	1,707	—	—	—	1,707
	333,115	**248**	**65,242**	**357,528**	**171,716**	**121**	**16,876**	**158,562**
1915	**235,620**	—	**60,791**	**288,260**	**100,560**	—	**2,353**	**94,237**
1916	**270,117**	**2**	**84,509**	**377,753**	**137,346**	—	**2,210**	**134,794**
1917	**257,781**	**14**	**48,013**	**424,992**	**127,436**	**4**	**655**	**171,720**
1918	**178,898**	**17**	**28,723**	**446,039**	**102,174**	—	**409**	**219,915**
1919	**252,790**	**977**	**29,052**	**362,137**	**175,302**	—	**591**	**241,247**
1920	**247,015**	**6,230**	**31,050**	**341,350**	**110,688**	**9**	**569**	**164,669**

Ordinary type represents Foreign. Heavy type represents Irish.

TABLE 15.

SHOWING THE IMPORTS OF MEATS (EXCEPT POULTRY AND GAME) INTO THE PORT OF LIVERPOOL DURING THE YEARS 1915, 1916, 1917, 1918, and 1919.

Description.	Years.				
	1915.	1916.	1917.	1918.	1919.
	£	£	£	£	£
Bacon	10,719,819	15,827,493	18,181,829	36,832,954	38,708,464
Beef, fresh and refrigerated ...	11,378,711	8,880,454	8,297,884	16,470,701	11,916,393
Beef, salted...	70,777	67,426	86,563	66,238	180,015
Hams	3,383,667	4,114,569	3,983,618	6,843,531	7,404,202
Mutton, fresh and refrigerated ...	2,443,754	2,751,913	2,116,322	2,128,352	2,219,436
Pork, fresh and refrigerated ...	324,167	966,652	469,406	424,056	310,654
Pork, salted	71,083	85,791	56,604	17,544	100,808
Rabbits	159,215	168,667	180,106	123,468	143,983
Unenumerated, fresh refrigerated and salted	801,044	1,101,843	1,214,946	930,022	2,588,273
Preserved, otherwise than by salting	1,941,040	3,663,457	6,160,807	9,443,132	13,012,291
Totals	£31,293,277	£37,628,265	£40,748,085	£73,279,998	£76,584,519

TABLE 16.

SHOWING THE QUANTITY OF UNSOUND MEATS SUPERVISED AND UTILISED DURING THE YEARS 1911 TO 1920.

Year.	Beef.				Mutton.				Pork.			
	Tons.	cwts.	qrs.	lbs.	Tons.	cwts.	qrs.	lbs.	Tons.	cwts.	qrs.	lbs.
1911...........	659	10	2	24	18	7	0	13	6	4	2	20
1912...........	684	8	3	0	475	12	1	2	9	12	3	18
1913...........	88	0	3	12	76	16	0	13	1	4	2	15
1914......	441	5	2	0	47	5	2	2	1	5	0	2
1915...........	221	7	0	10	23	14	0	4	2	8	3	21
1916...........	103	16	0	13	4	10	0	24	1	14	1	16
1917...........	510	9	3	14	24	11	3	20	0	14	3	16
1918...........	281	9	0	25	55	15	0	22	4	14	1	4
1919......... .	150	12	3	22	45	18	0	16	—	8	0	8
1920...........	30	8	2	23	95	8	0	6	—	16	0	16

TABLE 17.

SHOWING THE QUANTITY OF UNSOUND OFFAL SUPERVISED AND UTILISED DURING THE YEARS 1911 TO 1920.

Year.	Beef.	Mutton.	Pork.	Veal.
1911......	32,816 pieces.	56,596 pieces.	8,629 pieces.	1,070 pieces.
1912......	68,272 ,,	57,163 ,,	8,229 ,,	196 ,,
1913......	28,055 ,,	66,705 ,,	12,946 ,,	64 ,,
1914......	36,561 ,,	41,298 ,,	1,919 ,,	44 ,,
1915......	55,219 ,,	185,551 ,,	5,644 ,,	233 ,,
1916......	63,900 ,,	126,110 ,,	2,765 ,,	15 ,,
1917......	39,466 ,,	13,212 ,,	12,460 ,,	946 ,,
1918......	27,216 ,,	51,755 ,,	24 ,,	——
1919......	103,613 ,,	61,844 ,,	76,814 ,,	19 ,,
1920......	207,412 ,,	358,744 ,,	261 ,,	722 ,,

SHOWING THE QUANTITY AND DESCRIPTION OF OFFAL CONDEMNED DURING THE YEAR 1920.

Name of Organ.	Beef.		Mutton.		Pork.		Veal.	
	Number.	Weight, Pounds.	Number.	Weight, Pounds.	Number.	Weight, Pounds.	Number.	Weight, Pounds.
Livers	14,249	145,816	62,822	50,995	104	175	—	—
Kidneys	169,348	140,769	264,037	36,893	3	3	—	—
Sweetbreads	96	59	80	10	—	—	—	—
Tripe	4,482	48,143	60	66	—	—	—	—
Skirts	5,537	8,018	—	—	—	—	—	—
Hearts	4,032	11,894	25,475	10,975	—	—	—	—
Tongues	1,425	13,192	936	326	—	—	722	594
Tails	2,355	4,306	—	—	—	—	—	—
Heads	—	—	46	330	2	39	—	—
Brains	—	—	1,620	810	—	—	—	—
Cheeks	5,767	9,306	—	—	—	—	—	—
Plucks	—	—	40	96	69	384	—	—
Lungs	63	382	48	87	83	183	—	—
Melts	58	106	—	—	—	—	—	—
Fries	—	—	3,580	895	—	—	—	—
Totals	270,412	381,991	358,744	101,483	261	784	722	594

The organs dealt with above were rejected for various reasons, notably, decomposition and diseased conditions, such as Cysts, Inflammation, &c.

TABLE 19.

TABLE SHOWING THE QUANTITY AND DESCRIPTION OF UNSOUND MEATS SUPERVISED* DURING THE YEAR 1920.

Description.	Total Weight.				Cause of Destruction.											
					Tubercular.				Brine Stained, Mouldy and Decomposed.				Other causes. (Emaciation, Dropsy and Pleurisy).			
	Tons	cwts.	qrs.	lbs.	Tons	cwts.	qrs.	lbs.	Tons	cwts.	qrs.	lbs.	Tons	cwts.	qrs.	lbs.
Beef	30	8	2	23		—			30	7	1	27	0	1	0	24
Mutton	95	8	0	6		—			95	6	2	15	0	1	1	19
Pork	0	16	0	16	0	0	3	14	0	15	1	2		—		
Veal		—				—				—				—		
Total	126	12	3	17	0	0	3	14	126	9	1	16	0	2	2	15

* These were destroyed or allowed to go for industrial purposes to the satisfaction of the Medical Officer.

TABLE 20.

SHOWING QUANTITIES OF UNSOUND GENERAL FOOD-STUFFS SUPERVISED AND UTILISED DURING THE YEAR 1920.

Description.	No. of Tins.	Weight in Pounds.	Description.	No. of Tins.	Weight in Pounds.
Canned Goods—			Strawberries ...	6171	12677
Almonds ...	—	—	Beef	65891	295239
Apples ...	11082	66492	Mutton ...	19594	117564
Apricots ...	18252	24426	Sheep Tongues	2256	2256
Apricot Pulp ...	23245	154225	Ox Tongues ...	50 30	28912
Apricot & Peach	5289	232716	Ox Tails ...	361	722
Oranges ...	1548	1778	Tripe	1086	2172
Orange Pulp ...	214	2354	Soups	542	542
Cherries ...	406	1014	Stew	221	442
Fruit Pulp ...	2866	76546	Haddocks ...	3199	3199
Grapes... ...	413	309	Pilchards ...	6914	4088
Peaches ...	316	549	Sardines ...	45	12
Peach Pulp ...	277	11479	Sardine Paste...	10533	5266
Pears	10352	25103	Salmon ...	5975	5975
Pine Apple ...	44712	86817	Crab	1001	500
Plums	318	636	Fowl	2304	2304
Plum Pulp ...	209	2299	Rabbits ...	22451	41618
Prunes... ...	215	1690	Spaghetti ...	2450	2450
Tomatoes ...	84778	191248	Milk Condensed.	192349	168373
Tomato Pulp	1843	20273	Milk Evaporated	6432	4926
Tomato Sauce	55	275	Egg Pulp ...	688	25679

Description.	Packages.	Weight.			
Fruit (Fresh)—		Tons.	Cwts.	Qrs.	Lbs.
Apples	893	44	1	1	8
,, loose	—	32	8	0	0

TABLE 20—*continued.*

Description.	Packages.	Weight.			
		Tons.	Cwts.	Qrs.	Lbs.
Fruit (Fresh) *continued*—					
Melons	203	9	17	3	4
,, loose	—	21	6	0	12
Pears	857	46	13	3	7
Bananas	6,055	321	11	3	14
,, loose	—	36	0	0	0
Grapes	1 127	21	0	0	8
,, loose	—	1	0	0	0
Tomatoes	1,964	99	18	3	12
,, loose	—	3	10	0	0
Lemons	85	3	15	3	16
,, loose	—	5	16	0	0
Oranges	16,073	805	16	2	10
,, loose	—	2,471	18	0	0
Grape Fruit	12	—	10	2	24
Pears	857	46	13	3	7
Peaches	62	1	15	0	20
Cocoanuts	680	37	6	1	12
Pea Nuts	14	1	0	0	0
Chestnuts	749	104	19	0	0
Hazel Nuts	—	—	—	2	24
Mandarines	805	5	4	3	10
,, loose	—	2	0	0	0
Pomegranates	95	5	0	0	0
Fruit (Dried)—					
Dates	—	—	—	—	—
Figs	6,630	97	13	2	12
Currants	—	—	—	—	—
Raisins	488	5	15	3	14
Prunes	721	59	17	2	25
Sultanas	—	—	—	—	—

TABLE 20—*continued.*

Description.	Packages.	Weight.			
		Tons.	Cwts.	Qrs.	Lbs.
Vegetables—					
Potatoes...	5	—	4	2	11
,, loose...	—	—	—	—	—
Onions	434	22	10	1	8
,, loose	—	61	0	0	0
Turnips	120	6	0	0	0
Carrots	200	10	0	0	0
Cereals—					
Wheat	—	2,930	12	3	16
Maize	—	358	9	2	4
Oats	—	508	16	1	0
Barley	—	161	16	2	4
Peas	—	1	10	3	2
Beans	—	—	16	1	25
Rye	—	285	0	0	0
Flour	—	130	10	2	27
Rice	—	2	10	0	0
Corn Flour	—	7	5	0	1
Oatmeal...	—	—	—	1	0
Force	—	—	—	3	24
Wheat and Rye	—	60	0	0	0
General—					
Bacon	668	158	5	0	0
,, loose	—	—	—	—	—
Ham	592	139	15	3	0
Cheese, loose	—	—	7	0	0
Rabbits	9,187	256	4	1	18

TABLE 20—*continued.*

Description.	Packages.	Weight.			
General—*continued.*		Tons.	Cwts.	Qrs.	Lbs.
Premier Ices	252	33	15	0	0
Eggs, single	32,716	1	16	2	1
Poultry, single	427	—	12	1	20
Fish	106	15	15	1	22
Coffee Beans	12	—	10	2	12
Cocoa Beans	550	34	7	2	0
Copra	3	—	3	0	0
Condensed Milk	75	18	15	0	0

TABLE 21.

SHOWING THE TOTAL QUANTITIES OF THE DIFFERENT UNSOUND FOODSTUFFS SUPERVISED DURING THE YEAR 1920.

	Tons.	Cwts.	Qrs.	Lbs.
Beef, Mutton, Pork and Veal...	126	12	3	17
Offal (Beef, Mutton, etc.) ...	216	9	1	4
Canned Goods	725	10	0	25
Fruit and Vegetables	4,344	13	0	27
Cereals	4,447	9	1	19
General (Fish, Poultry, Rabbits, etc.)	661	7	2	17
	10,522	2	2	25

TABLE 22.

Showing comparative Value of the more important Food Stuffs imported at the principal Ports during the year 1919.

	London. 1	Liverpool. 2	Glasgow. 3	Man-chester. 4	Bristol. 5	Hull. 6	Leith. 7	South-ampton. 8	Newcastle. 9	Harwich. 10
	£	£	£	£	£	£	£	£	£	£
Animals	—	—	—	—	—	—	—	58,820	1,595,775	715,738
Butter	8,362,844	4,829,246	191,068	1,361,907	725,335	1,329,372	125,868	53,915	125,611	251,818
Cheese	9,436,228	2,117,132	694,157	1,073,663	685,078	444,233	269,748	40,766	—	84,505
Cocoa	3,871,399	5,884,616	—	—	10,758	—	—	130,319	—	—
Coffee	3,991,608	1,348,735	—	—	7	—	—	84,258	—	—
Grain	39,578,836	30,899,888	14,242,079	9,915,957	12,327,479	1,201,942	4,994,813	1,211,031	2,495,047	—
Eggs	6,636,515	4,043,536	1,067,757	428,626	124,314	1,612,185	286,941	105,686	936,637	141,238
Fish	4,641,206	4,906,904	—	—	371,917	970,920	669,691	128,190	273,312	157,478
Fruit	20,478,155	16,586,275	2,137,723	1,572,461	1,978,651	1,641,271	155,679	1,157,441	371,952	140,920
Lard	5,787,400	8,284,028	1,450,191	1,590,069	856,364	976,023	—	172,513	6,911	—
Margarine	2,723,203	3,105,627	156,693	—	—	863,022	618,512	—	144,962	316,002
MEAT :—										
Bacon	16,901,711	38,708,464	5,207,893	4,233,647	4,280,585	3,029,491	451,856	324,475	79,758	524
Beef, Fresh	14,035,186	11,916,393	914,737	807,134	406,053	525,098	—	1,701,736	—	—
,, Salted		180,015	—	—	—	—	—	—	—	—
Hams	3,779,476	7,404,202	2,841,439	798,091	437,586	540,446	—	154,848	—	—
Mutton, Fresh	12,147,345	2,219,436	997,178	1,142,295	12,837	22,835	—	120,134	—	—
Pork, Fresh	563,781	310,654	—	—	—	—	—	—	—	—
,, Salted	—	100,808	—	—	—	8,831	—	—	750	—
Rabbits	451,547	143,983	—	—	—	—	—	—	—	4,350
Unenumerated	2,482,501	2,588,273	—	—	—	34,574	—	—	—	—
Preserved	10,458,666	13,012,291	341,123	1,504,132	1,034,969	683,321	—	263,742	—	—
Milk, Condensed	5,582,271	4,918,133	1,765,062	916,125	954,689	774,267	326,783	369,757	50,222	16,921
Poultry and Game	248,185	1,225,366	—	—	—	54	—	33,802	—	2,101
Sugar	26,144,301	20,927,711	2,311,567	2,283,381	2,747,651	464,840	1,476,947	230,769	41,828	18
Vegetables	3,061,583	2,754,768	207,969	393,676	199,281	789,573	171,963	1,406,625	106,380	135,788

EMIGRATION.

There was a marked increase in the number of emigrants leaving the Port of Liverpool during the year 1920, the number being 204,868, an increase of 84,681 compared with the previous year, when the number of emigrants leaving the Port was 120,187. This is, of course, accounted for by the termination of the European war.

The following is a return of the number of emigrants and clearances of ships, including those passenger vessels in which medical inspection was not required, from 1900-1920:—

TABLE 23.

In	1900,	149,884	Emigrants, and	660	Clearances of Ships.
,,	1901,	167,452	,,	761	,,
,,	1902,	214,113	,,	791	,,
,,	1903,	265,918	,,	902	,,
,,	1904,	274,584	,,	924	,,
,,	1905,	277,536	,,	983	,,
,,	1906,	352,818	,,	1,090	,,
,,	1907,	385,797	,,	1,102	,,
,,	1908,	212,155	,,	1,113	,,
,,	1909,	253,400	,,	1,117	,,
,,	1910,	336,088	,,	1,149	,,
,,	1911,	312,027	,,	1,153	,,
,,	1912,	323,187	,,	1,165	,,
,,	1913,	347,541	,,	1,199	,,
,,	1914,	232,954	,,	1,065	,,
,,	1915,	75,387	,,	677	,,
,,	1916,	58,749	,,	562	,,
,,	1917,	18,908	,,	379	,,
,,	1918,	13,588	,,	287	,,
,,	1919,	120,187	,,	673	,,
,,	1920,	204,868	,,	769	,,

The following Tables, Nos. 24 and 25, relating to Emigration have been kindly supplied by the Board of Trade.

TABLE 24.

Statement showing the Number of Passengers of British and Foreign Nationality that left the Port of Liverpool for places out of Europe in the Year 1920 :—

DESTINATION.	British Subjects.	Aliens.	Total.
British North America ...	95,811	11,115	106,926
Australia and New Zealand	5,932	15	5,947
British South Africa ...	202	—	202
India (including Ceylon)...	11,462	276	11,738
Other British Colonies and Possessions ...	5,950	585	6,535
Total British Empire ...	119,357	11,991	131,348
United States	41,484	23,470	64,954
Other Foreign Countries	7,068	1,498	8,566
Total Foreign Countries ...	48,552	24,968	73,520
Grand Total ...	167,909	36,959	204,868

TABLE 25.

Number of Passengers of British and Foreign Nationality, as given in Table No. 24, that sailed from the Port of Liverpool, in each month of the year 1920:—

MONTH.	British Subjects.	Aliens.	Total.
January	7,609	1,015	8,624
February	7,939	1,719	9,659
March	12,024	886	12,910
April	15,217	1,426	16,643
May	17,541	1,880	19,421
June	16,507	1,881	18,388
July	18,186	3,348	21,534
August	15,131	4,665	19,796
September	18,367	6,334	24,701
October	16,500	4,442	20,942
November	11,710	4,220	15,930
December	11,178	5,143	16,321
Total	167,909	36,959	204,868

Emigrant Inspections.

All emigrants travelling second class or steerage on board vessels outward bound are subject to inspection by the Medical Officers of the Board of Trade, Dr. McLean and Dr. Macintyre. The crews of all such vessels bound for America are also subjected to inspection by these Officers. An Inspector of the Port Sanitary Authority attends these clearances in order to supervise the removal of all persons who may be rejected on account of actual or suspected infectious disease.

There were 133 such inspections, and 39 persons were rejected on account of infectious disease, most of whom were removed to the various City Hospitals.

TABLE 26.

Date.	Name of Vessel.	Nature of Sickness.	Where taken to	Description of Patient.
Feb. 18	**Cedric** ...	Tuberculosis ...	Returned to Kilfurman, co. Limerick, Ireland	Adult
,, 26	**Baltic...** ...	Impetigo	Boarding House, Duke Street	Infant
April 7	**Minnedosa** ...	Chicken-pox ...	Brownlow Hill Hospital...	Child
May 21	**Metagama** ...	Measles	City Hospital, Grafton Street	Child
June 2	**Empress of France**	Measles	Walton Infirmary ...	Child
,, 12	**Caronia** ...	Ringworm ...	Boarding House, Great George Square	Child
,, 12	,, ...	Trachoma ...	,,	Child
,, 12	**Megantic** ...	Impetigo	Boarding House, Duke Street	Child
,, 25	**Victorian** ...	Trachoma (2) ...	Boarding House, Duke Street	Adult Child
,, 25	,, ...	Locomotor Ataxia	Returned to Inverurie, Aberdeen	Adult
,, 26	**Metagama** ...	Chicken-pox ...	City Hospital, Fazakerley	Child
,, 30	**Empress of France**	Tinea Hicosa ...	Returned home to Wavertree	Adult
July 1	**Canada** ...	Ringworm ...	Returned to Darleston, Staffs.	Child
,, 1	,, ...	Epilepsy	Returned to London ...	Adult
,, 2	**Corsican** ...	Lupus	Returned Home	Adult

TABLE 26.—*Continued.*

Date.	Name of Vessel.	Nature of Sickness.	Where taken to.	Description of Patient.
July 2	**Corsican** ...	Abscess	Returned Home	Adult
„ 2	„ ...	Marasmus ...	Returned Home	Infant
„ 3	**K. A. Victoria**	Ringworm ...	Boarding House, Great George Square	Adult
„ 9	**Melita** ...	Chicken-pox ...	City Hospital, Fazakerley	Child
„ 9	„ ...	Mental Deficiency	Returned Home	Adult
„ 10	**Caronia** ...	Chicken-pox (3) ...	City Hospital, Fazakerley	Children (2) Adult (1)
„ 23	**Minnedosa** ...	Trachoma (2) ...	Boarding House, Paradise Street	Child (1) Adult (1)
„ 28	**Empress of France**	Emaciation ...	Returned Home	Infant
„ 28	**Metagama** ...	Deformed	Returned Home	Adult
Aug. 7	**Caronia** ...	Impetigo	Returned to Nuneaton ...	Infant
„ 7	„ ...	Scabies and Urticaria ...	Returned to Nuneaton ...	Infant
„ 25	**Empress of France**	Lupus	Returned to Glasgow ...	Adult
„ 27	**Minnedosa** ...	Chicken-pox ...	City Hospital, Fazakerley	Child
Sept. 4	**Megantic** ...	Trachoma (3) ...	Boarding House, Duke Street	Adults
„ 15	**Victorian** ...	Erysipelas of Eye	Boarding House, Paradise Street	Adult
Oct. 13	**Victorian** ...	Pul. Tuberculosis	Returned to Lisburn (Ireland)	Adult
„ 14	**Canada** ...	Tubercular Glands	Returned home to Dartford, London	Adult
Dec. 31	**Empress of Britain**	Diphtheria ...	City Hospital, Mill Lane...	Adult

Before closing this Report the Medical Officer to the Port Sanitary Authority desires to express his appreciation of the valuable assistance received from H.M. Collector of Customs and Staff, The Mersey Docks and Harbour Board and their Officers, and the various Shipping Companies who have co-operated with the Port Sanitary Authority in preventing disease, and have worked harmoniously together in every particular. The Consular Body have at all times given courteous assistance.

E. W. HOPE, M.D.

MUNICIPAL OFFICES,
LIVERPOOL, 23*rd June*, 1921.

APPENDIX No. 1.

REPORT ON RAT-FLEA INVESTIGATION

BY

PROFESSOR R. NEWSTEAD, F.R.S.

AND

ALWEN M. EVANS, M.Sc.

INTRODUCTION.

The investigation was carried out in conjunction with Dr. E. W. Hope, Medical Officer of Health for the City of Liverpool, and his assistant Dr. W. Hanna, whose material assistance has made it possible for us to carry it to a successful conclusion.

The object of the investigation was to determine the distribution of the various species of fleas occurring on the rats in the Port and City of Liverpool, with special reference to those species which are responsible for the transmission of plague from rat to rat and from rat to man.

The period during which the investigation was carried out extended from April 12th, 1920, to April 12th, 1921, rats being examined daily five times each week, except during the month of August and from December 22nd, 1920, to January 12th, 1921.

TECHNIQUE.

As a preliminary to these investigations, field observations were conducted as to the general methods adopted by the professional rat catchers in the capture of the animals on board ship and in the city.

It was then decided that the rats sent to the laboratory for examination were to be taken alive from the traps and placed singly in strong calico bags. The bags were subsequently placed in a lethal chamber where they remained until the rats and the fleas upon them were dead. This method ensured that all the fleas living on each rat at the time of capture were secured.

LABORATORY METHODS.

The fleas were collected from each bag and contained rat, over a sheet of white paper, and placed in a numbered watch-glass containing glycerine. In this medium they were arranged in rows on a slide and identified by microscopical examination.

DEFINITION OF ZONES.

ZONE I.—SHIPS. The number of ships from which rats were received was 125. The ports from which the ships sailed are named in Table I (*vide infra*).

ZONE II.—DOCKS, ETC. This zone comprises that part of the Port of Liverpool lying West of the line: Stanley Road, Scotland Road, Cazneau Street, St. Anne Street, Norton Street, Seymour Street, Russell Street, Clarence Street, Rodney Street, Upper Duke Street, Great George Street, St. James Place, Park Road.

(*a*) *Docks.*—This section of Zone II is limited to the wharves themselves and the sheds actually situated on the Docks.

(*b*) *Warehouses.*—This section includes the rest of Zone II; the majority of the buildings from which rats were received were warehouses.

ZONE III.—CITY. All of the City East of the line bounding Zone II, including the streets named above, is included in this Zone.

TABLE I.

SHOWING THE NUMBER OF RATS RECEIVED FROM SHIPS SAILING FROM THE VARIOUS PORTS.

Region.	Port.	No. of Rats.
Mediterranean ...	Alexandria ...	64
	Constantinople...	5
	Costanza ...	2
	Genoa	5
	Salonika ...	4
		80
India, Ceylon, E. Indies, Burma	Bombay* ...	5
	Calcutta* ...	18
	Colombo* ...	4
	Rangoon* ...	47
	Java*	1
		75
East Africa ...	Beira*	1
	Mombasa* ...	3
	Various Ports ...	1
		5
West Coast of Africa	Various Ports ...	59
West Coast of S. America	Valparaiso ...	5
	Callao	13
	Coronel	18
	Pisco*	3
	Talcahuano ...	3
	Various Ports ...	33
		75
Brazil	Bahia*	1
	Pernambuco* ...	18
	Rio de Janeiro*	13
	Rio Grande ...	5
		37
Argentine ...	Buenos Aires ...	53
	R. Plate ...	17
	Rosario ...	15
		85
North America...	Galveston ...	14
	New Orleans ...	40
	New York ...	1
		55

* Within the Tropics.

THE SPECIES OF RATS.

No attempt is made to separate the varieties of the species *Mus rattus* and *Mus norvegicus*. *Mus rattus* and its varieties are included under the heading "black rat," and *Mus norvegicus* and any varieties are referred to as "brown rats."

As will be seen from the following table, all the rats received from ships were black. In Zone IIa the black rats outnumbered the brown rats by nearly 5 to 1. In Zone IIb, the black rats were much more numerous than the brown rats. In Zone III, however, the position is more than reversed, the brown rats being nearly nine times as numerous as the black rats.

TABLE II.

SHOWING THE DISTRIBUTION OF BLACK AND BROWN RATS.

Zone.	Black Rats.	Brown Rats.	Total.
I.	469	—	469
IIA.	24	5	29
IIB.	442	274	716
III.	20	179	199
TOTALS	955	458	1,413

TABLE III.

THE SPECIES OF RAT-FLEAS.

SHOWING DISTRIBUTION OF THE VARIOUS SPECIES OF FLEAS.

Zone.	*Xenopsylla cheopis.*	*Ceratophyllus fasciatus.*	*Ceratophyllus londiniensis.*	*Leptopsylla musculi.*	*Ctenocephalus Canis.*	Totals
I. ...	489	219	—	8	—	706
IIA.	10	75	—	9	—	94
IIB.	60*	1,510	3	326	—	1,899
III. ...	3	320	12	10	1	346
TOTALS	562	2,124	15	353	1	3,045

* This figure includes 56 specimens from No. 32 T—— Street.

OBSERVATIONS ON THE VARIOUS SPECIES OF FLEAS FOUND.

Xenopsylla cheopis, Rothsch.—The Indian Plague flea is " the common rat flea of the Tropics " (Rothschild, 1910). It is prevalent also in sub-tropical countries, and " is common during summer and autumn in some of the warmer parts of the temperate zone, more especially in ports which have maritime intercourse with the Tropics " (Chick and Martin, 1911). It has been demonstrated experimentally by Bacot (1914) that temperatures below 40° F. are fatal to all stages but the imagino of this species. Its almost complete absence from more northern latitudes is therefore attributed to the low winter temperatures which prevail there. In England, *X. cheopis* has been recorded from a brown rat at Plymouth (1 specimen) (Rothschild, 1905) from a plague-infected brown rat at Bristol (2 specimens), 1916, which was taken in a rag factory that was the seat of an outbreak of plague, and in 1911 from Guy's Hospital, London, where the species had established itself on a colony of brown rats, altogether more than 400 specimens of *X. cheopis* were taken from 45 rats. It was found that the infested rats were living in an artificially heated environment beneath the laboratory, and the presence of this, the first flourishing colony of *X. cheopis* to be found in this country, was attributed to this fact.

Seasonal Variation. Zone I is the only zone from which a sufficient number of specimens of *X. cheopis* have been found to allow of any deductions as to seasonal variation. The highest figure was reached in June, 1920, and the months of September, October, November, show a second, but not so great elevation, falling to the lowest figure in December.

In view of the prophetic statement put forward by Chick and Martin (1911, p. 125), it is interesting to observe that we have found a number of *X. cheopis* on the ship rats during every month in the year, the lowest being 0·30 in December, 1921, and the highest 2·18 in June—not in September, as might have been expected.

Owing to the large numbers of *Xenopsylla cheopis* which occur on ship rats, it would appear likely that this species should be found on some of the rats found in the dock sheds. This was found to be the case; out of the 24 rats received from Zone IIa, three were found to carry *X. cheopis*. The data were as follows:—

TABLE IV.

No.	Date.	Rat.		Building.	*X. cheopis.*
		Black.	Brown.		
127	31. v.20	1	—	S. H—— Dock	2
148	7.vi.20	1	—	S. C—— Dock	7
192	23.vi.20	—	1	C—— Dock	1
Total ...		2	1		10

In Zone II (*b*), and Zone III, apart from the colony of *X. cheopis* found in T—— Street, which is dealt with in a separate section, isolated specimens of this species were found in a few cases. The data are as follows:—

TABLE V.

ZONE IIB.

No.	Date.	Rat.		Building.	*X. cheopis.*
		Black.	Brown.		
1019	21. i.21	—	1	14 C—— Street	1
1127	10. ii.21	—	1	29 C—— Street	1
1135	11. ii.21	—	1	27 K—— Street	1
1417	12.iv.21	—	1	M—— Mills	1
Total ...		0	4		4

ZONE III.

No.	Date.	Rat.		Building.	*X. cheopis.*
		Black.	Brown.		
1068	31. i.21	—	1	5 B—— Road	1
1401	8.iv.21	1	—	W—— Village	2
Total ...		1	1		3

Ceratophyllus fasciatus, Bosc. This is the common rat flea of temperate countries. In the rural districts of Suffolk and North Essex, Strickland and Merriman found this species to comprise 60 per cent.

of the flea population of rats. Our figures show a much higher percentage of *C. fasciatus* for the City of Liverpool, 78 per cent. in Zone IIb and 92 per cent. in Zone III.

Zone IIb. Table VII shows a markedly high average during the months May—September, the maximum figures occurring in the two months named. After September the figures fall at first rapidly, then gradually, with a slight rise during February. The figures for Zone III show much the same range, if we exclude the very high rise in January. During this month only nine rats came in from this Zone, of which two were heavily infested, the other seven giving an average of 0·7 *C. fasciatus* per rat; the number 4·11 cannot, therefore, be taken as a true index of the number of *C. fasciatus* per rat during this month.

Hosts.—All the rats from Zone I were black, therefore no comparison between the number of fleas found on the different species of rats can be made for this zone.

In Zone II the infestation of brown rats with *C. fasciatus* was rather heavier than that of the black rats.

The numbers are:—

Brown rats	No. fleas per rat	2·48
Black rats	,, ,,	1·88

In Zone III the difference was more marked:—

Brown rats	1·69
Black rats	0·85

Leptopsylla musculi.—This is a widely distributed species naturally parasitic on mice (*Mus musculus*), but frequently found on rats where the latter inhabit buildings, etc., frequented by mice. This species is a proved potential carrier of *plague bacillus* and " a small percentage " will, according to Bacot (1919) bite " man under certain conditions." Strickland and Martin, 1913, found it to comprise a very small percentage of the flea fauna of rats in East Suffolk and North Essex, only three specimens being taken in all. Bacot (1919), however, considers that this species may be more prevalent in England than this figure suggests. As the following figures show this is the case in the City of Liverpool:—

	% *L. musculi.*
Zone IIa	9·7% of total
Zone IIb	17·2% ,,
Zone III	2·8% ,,

Owing to the very slender shape and pointed head of *L. musculi*, the species can be readily distinguished from any other rat flea.

Table VII clearly shows that the species is most prevalent in Zone II during the months June-September after which the numbers fall away to almost zero during December-April.

Hosts.—The numbers of *L. musculi* per rat were almost equal on the two species, the averages were:—

Zone II.	Brown rat—No. fleas per rat	0·41
	Black rat—No. fleas per rat	0·48
Zone III.	Brown rat—No. fleas per rat ...	0·05
	Black rat—No. fleas per rat	0·05

Ceratophyllus londiniensis Roths. This species is said to be (Rothschild, 1911) " A rare Mediterranean species, probably introduced by port rats, has occurred in the house mouse (*Mus musculus*), and *possibly* on the brown rat (*Epimys Norvegicus*) in London, Dover, and Aberdeen." It is easily distinguished from *C. fasciatus* by the form of the external armature in the male and of the spermatheca in the female.

Its distribution in Liverpool is interesting; apart from two isolated records in Zone II, the records, four in all, came from the Smithdown Road, Lodge Lane area, where the species appears to have established itself.

Ctenocephalus canis, Curtis.—The common dog flea. This species has frequently been recorded from rats sometimes in large numbers. It was therefore surprising to find only one specimen which occurred in a brown rat from Zone III.

Ctenopthalmus agyrtes, Heller.—Strickland & Merriman and Nuttall & Strickland working in rural districts of East Anglia found this species to comprise a large proportion of the rat fleas in this part of England. Our records, however, show a complete absence of this species. Rothschild (1915) states that this species occurs on the " brown rat . . . living in the fields and on the bank vole . . ., the common shrew . . . and others." It is not therefore surprising that it is not found on rats in such an urban district as the City of Liverpool. Further, ten other species of Pulicidae, which are recorded by the above named authors, from rats in East Anglia, and which are naturally parasitic on birds and small wild mammals are likewise absent from our records.

PERMANENT BREEDING PLACES OF *XENOPSYLLA CHEOPIS.*

On the last day of January, 1921, a specimen of *X. cheopis* was found on a brown rat from No. 32, T—— Street. We requested that more rats should be sent from this building and altogether we received during the first half of February 13 brown rats from which no fewer than 56 *X. cheopis* were taken. The records were as follows:—

TABLE VI.

No.	Date.	Brown.	*X. cheopis.*	C. *fasciatus.*
1067	31. i.21	1	1	—
1087	3.ii.21	1	5	2
1094	4.ii.21	1	5	7
1095	4.ii.21	1	5	4
1096	4.ii.21	1	9	4
1097	4.ii.21	1	7	2
1103	7.ii.21	1	6	0
1104	7.ii.21	1	2	8
1105	7.ii.21	1	6	4
1106	7.ii.21	1	1	0
1107	7.ii.21	1	3	4
1108	7.ii.21	1	5	2
1133	11.ii.21	1	1	—
Total		13	56	37

Average *X. cheopis* per rat = 4·2.

There can be no doubt that here at T—— Street is a second "flourishing colony of *X. cheopis* in the British Islands." As in the case of the first such colony to be discovered, Rothschild (1911), its existence is probably to be attributed to the fact that its hosts were living in an artificially heated environment.

Beneath the middle of the roadway adjoining the premises T—— Street runs a steam culvert which belongs to a sugar refinery on the opposite side of the road. The excavations, which it was possible to make, revealed that the rat burrows lead in the direction of the culvert. It was therefore thought probable that the nests of the rats were situated in the near neighbourhood of the steam culvert, and, as the temperature of the latter was found on 21.2.21 to be 105° F., the area surrounding it for a considerable distance must be maintained at a temperature higher than the normal. Unfortunately it was impossible to trace the burrows far enough to discern whether the nests were actually within the area influenced by the steam culvert, and therefore the suggested explanation of the presence of this colony of *X. cheopis* can only be regarded as an extremely probable one.

TABLE VII.

SHOWING THE AVERAGE FREQUENCY DURING EACH MONTH OF THE COMMON SPECIES IN THE ZONES IN WHICH THEY OCCUR.

te.	Average Mean Temperature.	Average Humidity.	ZONE I.		ZONE II (*b*).		ZONE III.
			Xenopsylla cheopis	*Ceratophyllus fasciatus.*	*Ceratophyllus fasciatus.*	*Leptopsylla musculi.*	*Ceratophyllus fasciatus.*
l	46·3°	73	0·33	1·75	12·66†	0·0	No rats received
....	52·9°	74	0·59	0·90	5·38	0·32	„
....	57·8°	73	2·18	0·40	3·28	1·84	3·27
....	57·2°	79	0·51	0·16	2·70	0·89	1·07
ust	56·4°	80		Investigation	suspended.		
ember	55·5°	81	1·58	0·0	5·17	1·83	2·24
ber ...	51·1°	84	1·75	0·22	1·82	0·46	1·09
ember...	45·8°	83	1·18	0·37	1·61	0·41	0·68
ember	40·5°	86	0·30	0·09	1·29	0·06	0·58
uary ...	46·0°	84	0·48	0·03	1·19	0·04	4·11†
uary ...	41·1°	84	0·93	0·75	1·33	0·04	1·27
ch	45·5°	79	0·90	0·70	1·08	0·07	1·00
l	46·7°	74	1·00	—	0·61	0·09	0·40

†Based on a very small number of records.

SUMMARY.

I. Five species of fleas were found to occur on rats from the ships, Port and City of Liverpool. They were —*Xenopsylla Cheopis*, *Ceratophyllus fasciatus*, *Leptopsylla musculi*, *Ceratophyllus londiniensis*, and *Ctenocephalus canis.*

II. The Plague Flea, *Xenopsylla Cheopis* occurred freely on ship rats throughout the whole period of the investigation. It was also found on three rats from the dock sheds, and isolated specimens were found on four rats from Zone IIb, and on two rats from Zone III *A permanent breeding place of the species was discovered in certain premises in Zone IIb.*

III. *Ceratophyllus fasciatus* was universally prevalent during the whole course of the investigation. The number of fleas per rat was greatest during the summer months.

IV. *Leptopsylla musculi* was most prevalent on rats from Zone II. It occurred very rarely upon ship rats. *Ceratophyllus londiniensis* was found rarely in Zone II and III and of *Ctenocephalus canis* one specimen was taken in Zone III.

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Rothschild, N. C. (1916). "The occurrence of *Xenopsylla cheopis* Roths., in Bristol." *Ent. Mo. Mag.* Ser. 3, Vol. 2, p. 279.

APPENDIX No. 2.

PROPOSED LEGISLATION IN REGARD TO VENEREAL DISEASE.

The following is the form in which the clauses were finally drawn up so that the Parliamentary Committee could consider them and form a definite opinion as to the advisability of their acceptance:—

> The expression " venereal disease " means gonorrhœa gonorrhœal ophthalmia syphilis soft chancre venereal warts or venereal granuloma:
>
> The expression " medical adviser " means a duly qualified medical practitioner practising within the City:
>
> The expression " treatment " means medical treatment by a medical practitioner or medical adviser:
>
> Any reference to a medical practitioner or medical adviser shall in any case where a person attends for treatment at a hospital centre or otheer place provided by the Corporation mean the medical practitioner of such hospital centre or other place for the time being in charge of cases of venereal disease thereat:
>
> " Person " means any person for the time being resident within the City except where used in conjunction with the word " any."

The Corporation may make effective provision for the gratuitous reception, accommodation, examination and treatment of persons suffering from venereal disease and may do or provide any such other act or thing, as may in the opinion of the Corporation be necessary, for securing such effective provision as aforesaid.

Every person suffering from any venereal disease as soon as he is aware or has reason to believe that he is suffering from such disease shall forthwith consult a medical adviser with respect thereto and shall furnish to him his correct name and address and shall place himself under his treatment.

Every such person shall until he has received a certificate of freedom from infection in accordance with the provisions of this Part of this Act or until he has ceased to be resident within the City continue to attend or cause himself to be attended by his medical adviser at least once in every two weeks or at such other shorter interval as may be prescribed by the Minister of Health and shall as far as possible follow the advice given and carry out the treatment prescribed by such medical adviser.

If such person shall at any time decide to change his medical adviser or if the medical adviser treating such person die or for any reason be unable or unwilling to attend him further, then such person shall forthwith consult and place himself under the treatment of another medical adviser and immediately after so doing shall inform his new medical adviser of his correct name and address, and of the name and address of his last previous medical adviser, and the medical adviser so informed shall thereupon send a notification of the change made by such person to such previous medical adviser if he be alive.

Any person offending against or failing to comply with any of the provisions of this section shall be liable to a penalty not exceeding twenty shillings in respect of each day during or in which he so offends or fails to comply.

Any parent guardian or any person in charge of any child or defective suffering from any venereal disease who knows or has reason to believe that such child or defective is so suffering, shall cause such child or defective to be treated for such disease by a medical adviser and to carry out and continue such treatment in accordance with the provisions of this Part of this Act relating to persons suffering from venereal disease.

In this section the expression "child" means a person under the age of sixteen years and the expression "defective" means a person who would be deemed to be a defective under the provisions of Section 1 of the Mental Deficiency Act 1913 and in either case resident within the City.

Any parent guardian or any person as aforesaid offending against or failing to comply with any of the provisions of this section shall be liable to a penalty not exceeding twenty shillings in respect of each day during or in which he so offends or fails to comply.

Every medical adviser attending or treating a person who is suffering from any venereal disease in an infectious stage—

> Shall by written notice direct the attention of such person to the infectious character of the disease and to the necessity of continuing treatment until free from liability to infect in respect thereof and to the penalties prescribed by this Part of this Act for infecting any other person with such disease:
>
> Shall when such person informs such medical adviser that he intends to change his medical adviser issue to such person a treatment card containing particulars of the stage of treatment which such person has reached for the information of the new medical adviser:
>
> Shall when such person shall have ceased to be liable to convey infection in respect thereof, and on being satisfied of the fact, issue to such person a certificate accordingly:
>
> Shall in the event of such person not having received from such medical adviser a certificate of cesser of liability to infect in respect thereof failing to consult or attend such medical adviser for a period of three weeks and of such medical adviser not having received within that period from another medical adviser a notice that such person has changed his medical adviser send to the medical officer a notice of the facts stating the name and address of such person.

The Corporation shall supply to any medical adviser on demand for the purposes of this Part of this Act cards and certificates in blank in such form as the Corporation with the approval of the Minister of Health may prescribe and shall subject to such regulations as may be prescribed with respect thereto by the Minister of Health pay to any medical adviser in private practice for each such card or certificate issued by him such sum as shall be prescribed in such regulations.

Any medical adviser issuing any certificate knowing the same to be false in any particular shall be liable to a penalty not exceeding fifty pounds.

The medical officer upon receipt from any medical adviser of a notice under the provisions of the section of this Act of which the marginal note is "As to duties of medical adviser" shall make inquiries of the person named in such notice as to the reason of such person's discontinuance of treatment and unless satisfied of the existence of any adequate reason therefor shall lay an information against such person before a court of summary jurisdiction.

Upon the hearing of any such information the court if satisfied that the person named therein is suffering from any venereal disease in an infectious stage and is not undergoing treatment in respect thereof may make an order requiring such person forthwith to resume treatment in respect of such disease and to continue such treatment until he has received a certificate of freedom from infection in accordance with the provisions of this Part of this Act.

Any person not complying with any such order shall upon summary conviction be liable to a penalty not exceeding one hundred pounds or to imprisonment for not more than six months with or without hard labour or to both such penalty and imprisonment.

Any person in charge of any hospital workhouse gaol asylum or other public institution within the City shall at least forty-eight hours prior to the discharge therefrom of any person therein undergoing treatment in respect of any venereal disease inform the medical officer in writing of the date on which such person is intended to be discharged.

The Corporation may remove any such person on his discharge from such hospital workhouse gaol asylum or other public institution to any hospital or other place provided by the Corporation.

If any such person is found to be suffering from any venereal disease in an infectious stage and is in the opinion of the medical officer or other medical adviser called in by or on behalf of the medical officer likely unless detained to infect any other persons such person (subject to the provisions of this section) may be detained in such hospital or other place until he has ceased to be liable to convey infection in respect of such disease.

Any person so detained may from time to time apply in writing to a court of summary jurisdiction to be examined by two medical advisers and thereupon the court shall direct two or more medical advisers named in the order (one of whom shall be nominated by the medical officer and the other by or on behalf of the person detained) to examine such person accordingly and report the result of such examination to the court and any person in whose charge such person is shall permit such examination.

After considering such report the court shall unless of opinion that such person is still liable to convey infection in respect of such disease and is likely unless detained to infect others, order the release of such person from detention and he shall be released accordingly.

No such application shall be made by any person so detained within less than three months after he has made a like prior application.

Any person who knowingly infects any other person with a venereal disease or knowingly does or permits or suffers any act likely to lead to the infection of any such other person with any such disease shall be liable upon summary conviction to a penalty not exceeding one hundred pounds or to imprisonment with or without hard labour for not more than twelve months or to both such penalty and imprisonment.

All proceedings in any court in respect of any offence committed against or under the provisions of this Part of this Act or anything arising thereunder shall be heard in camera and any person publishing in any newspaper any report of any such proceedings shall be liable to a penalty not exceeding fifty pounds.

Any and every person employed in the administration or execution of this Part of this Act shall preserve secrecy with regard to all matters that may come to his knowledge in consequence of such employment and shall not communicate any such matter to any other person except in the performance of his duties under this Part of this Act.

Any person offending against the provisions of this section shall be liable to a penalty not exceeding one hundred pounds.

All expenses incurred by the Corporation in carrying into execution the provisions of this Part of this Act shall be chargeable upon the general rate.

APPENDIX No. 3.

PORT OF LIVERPOOL SANITARY AUTHORITY.

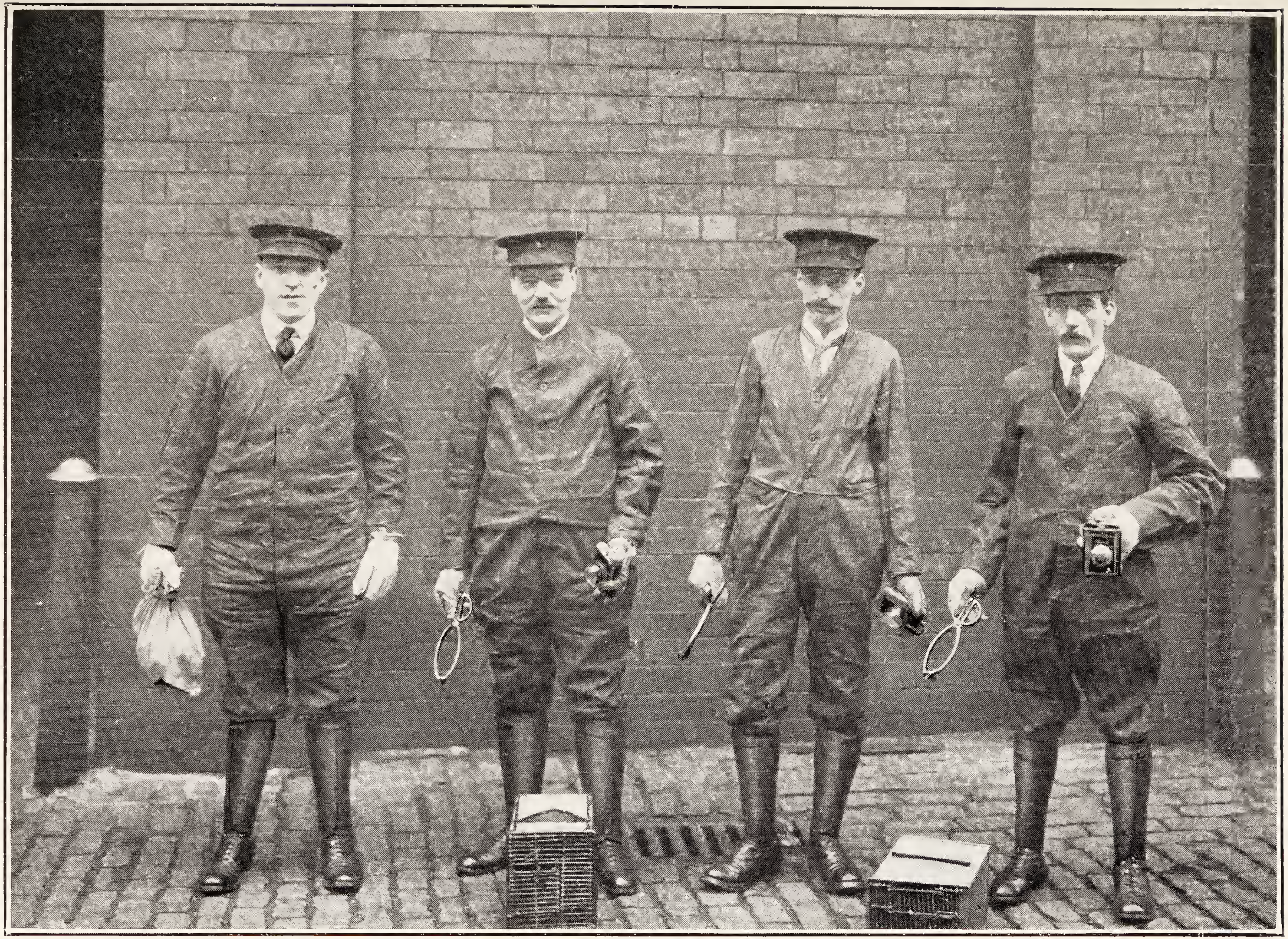
To..

....

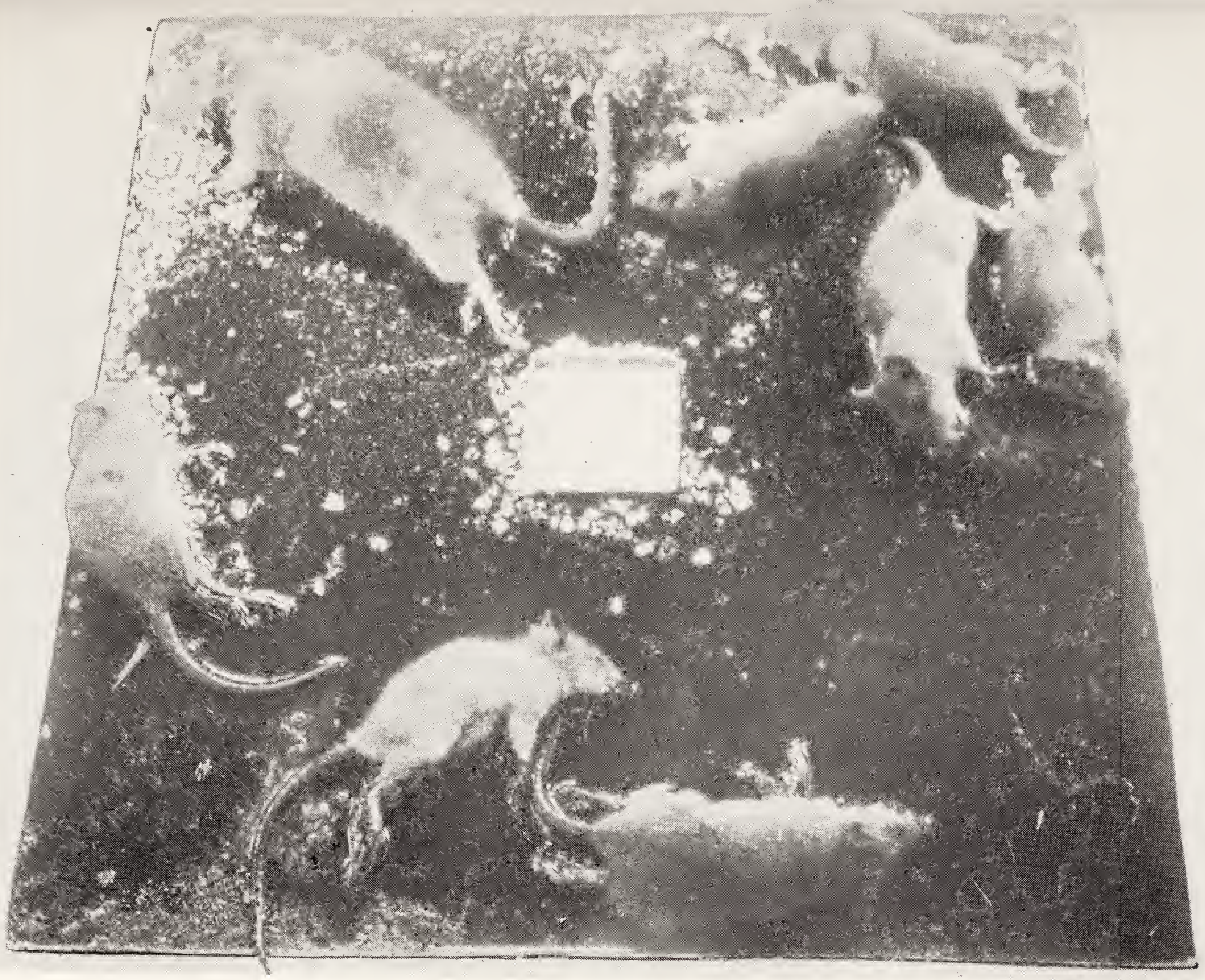
THIS IS TO CERTIFY that holds Nos. ....
.....................of the steamship.......................of Liverpool, were on the...192 efficiently fumigated, while empty, for the destruction of rats by sulphur gas.

The gaseous mixture contained sulphur di-oxide in a proportion of not less than......per cent., and the holds were kept filled for a period of not less than..............................hours.

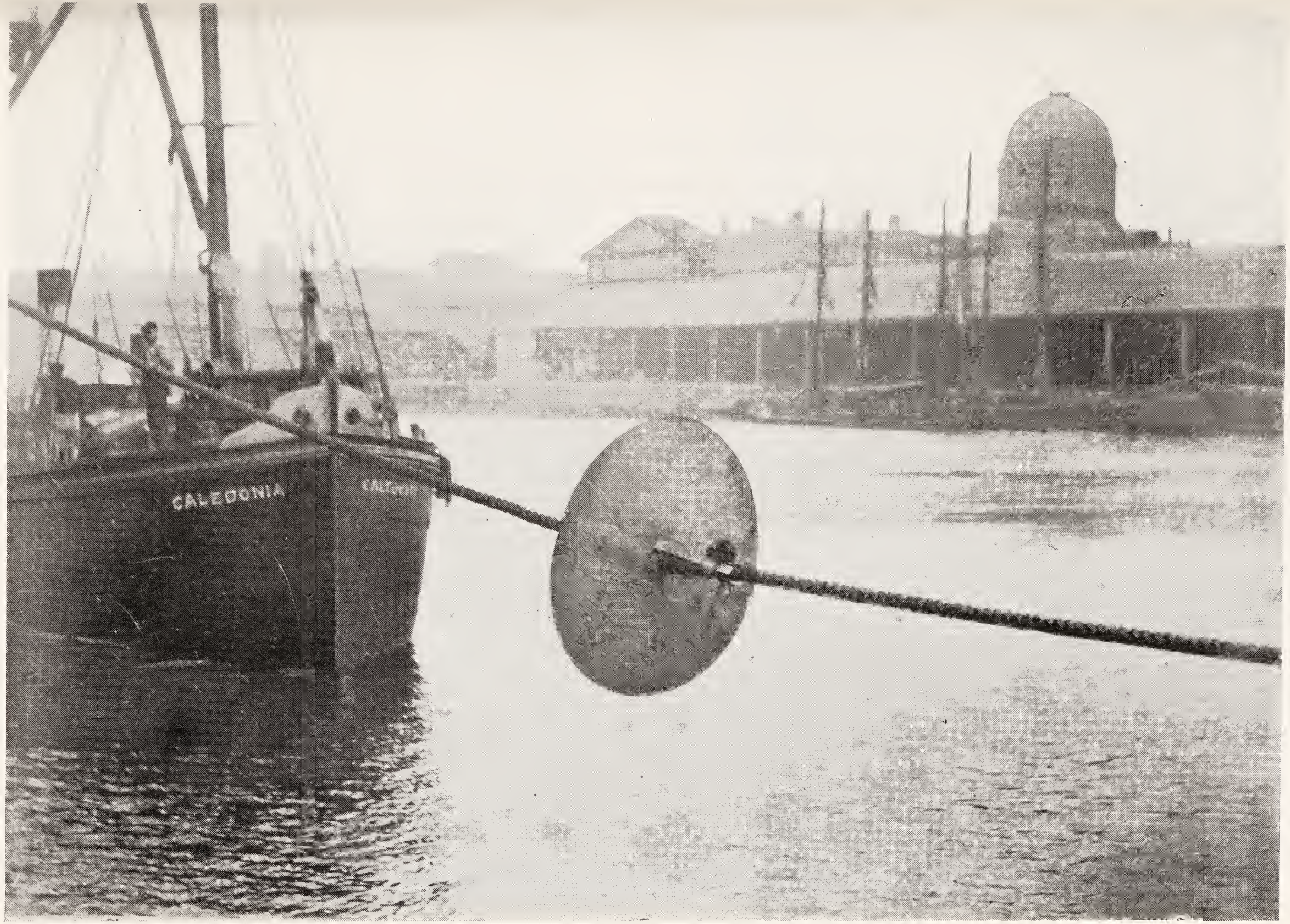
Medical Officer of Health.



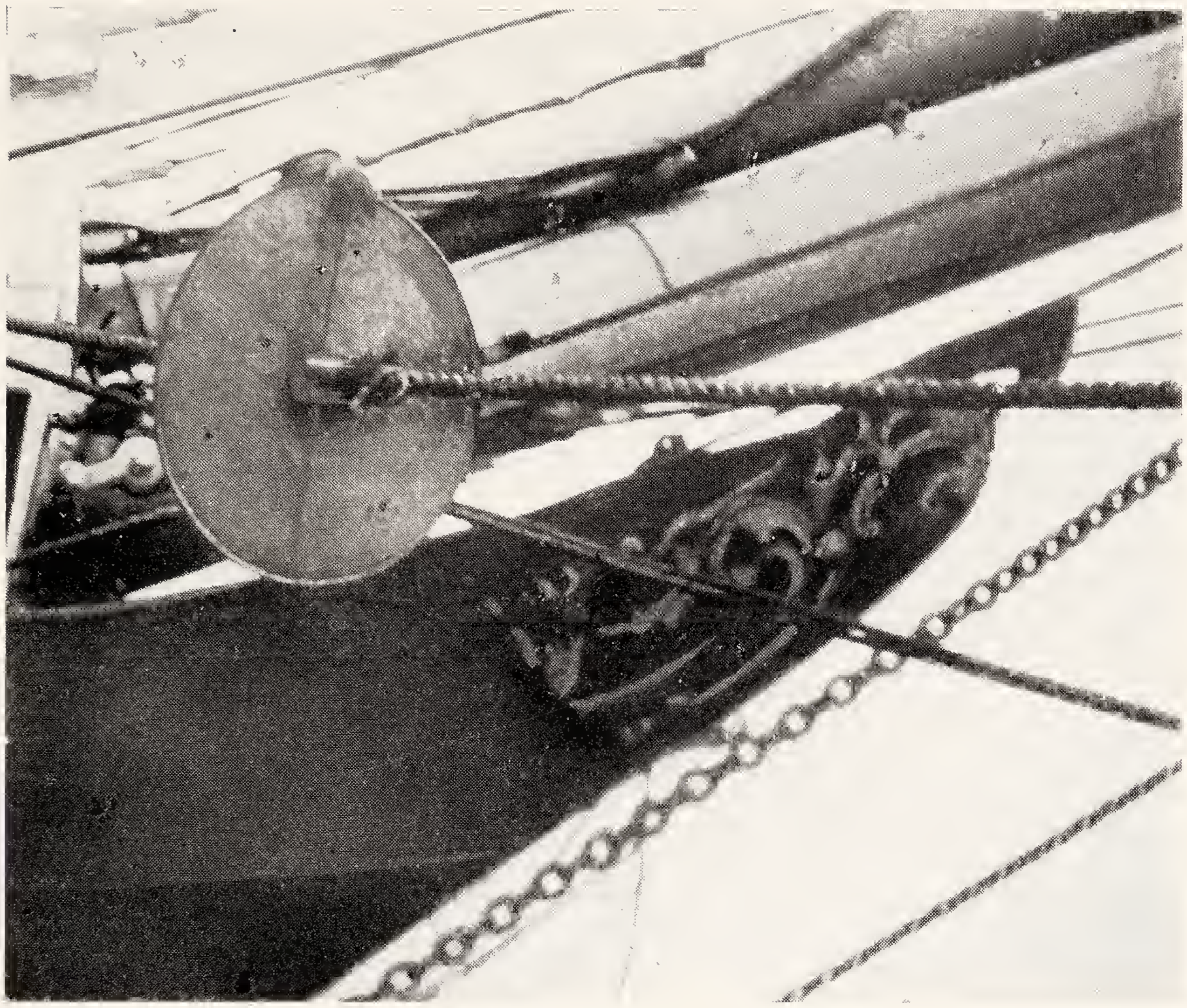
RAT SEARCHERS IN SPECIAL UNIFORM AND EQUIPMENT.



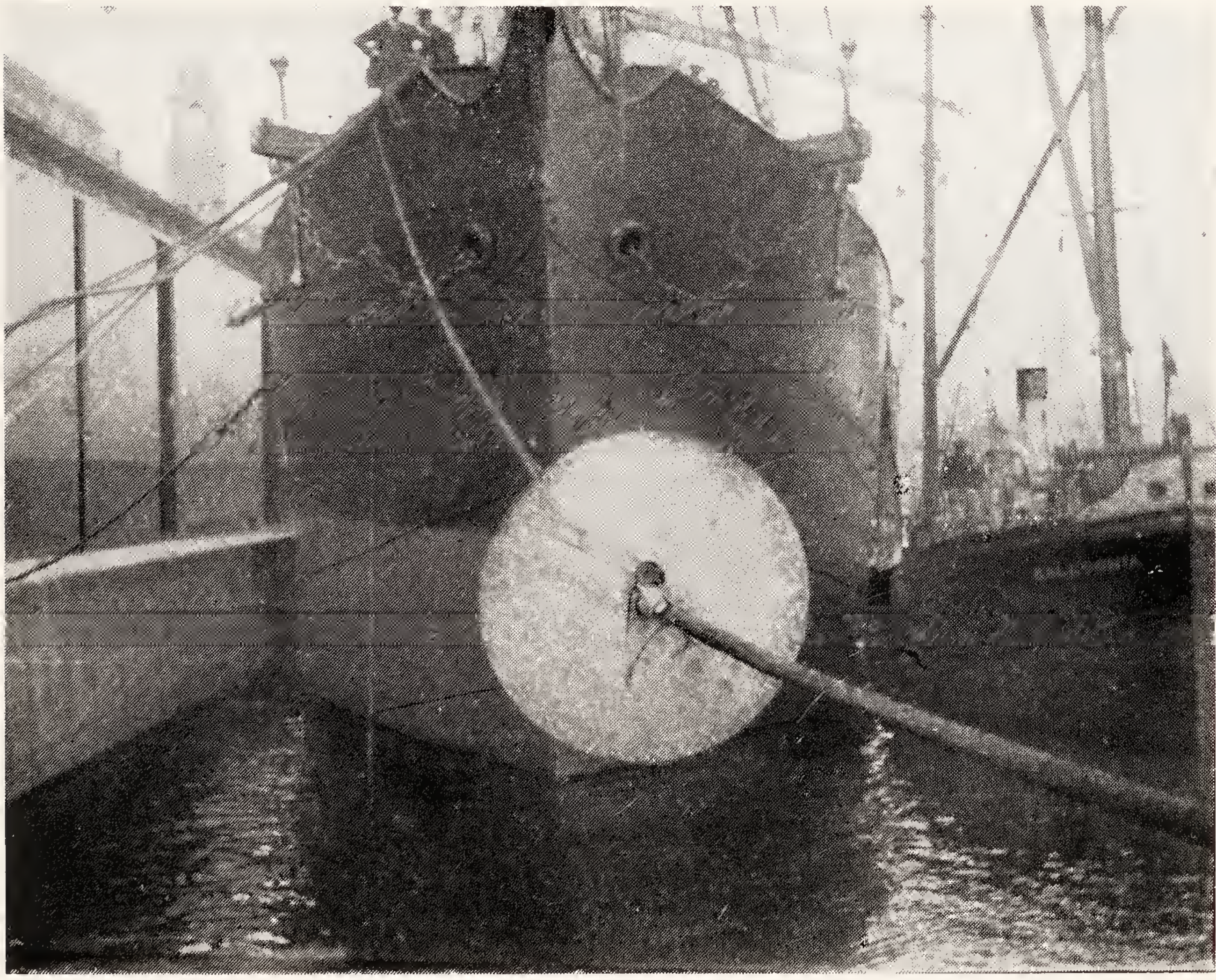
A METHOD OF DESTROYING RATS USED IN LIVERPOOL FOR MANY YEARS.
RATS CAUGHT BY A SPECIAL BIRDLIME OR VARNISH SPREAD ON A TRAY.



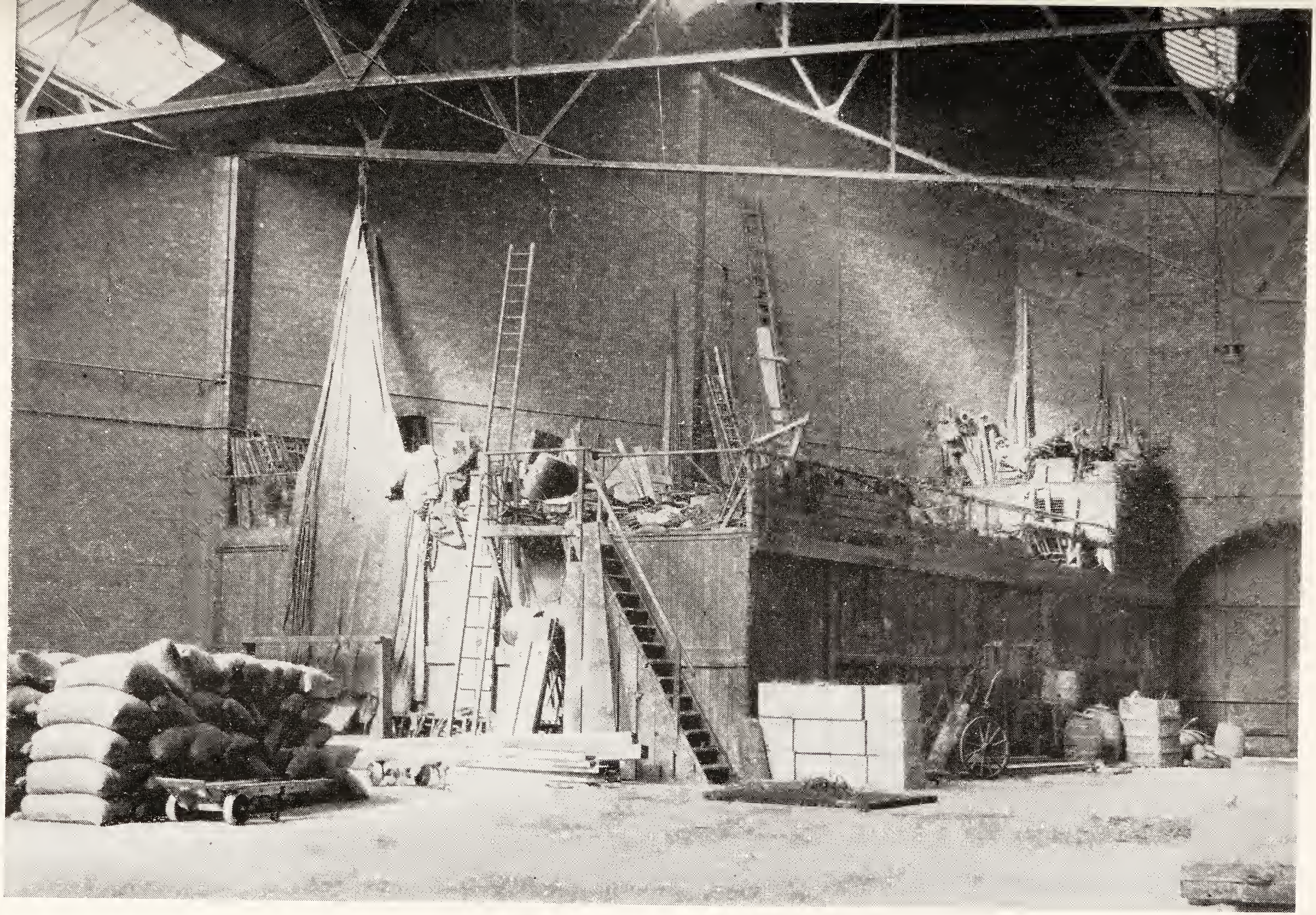
AN IMPROVED TYPE OF RAT-GUARD.—A RAT UNABLE TO CROSS.



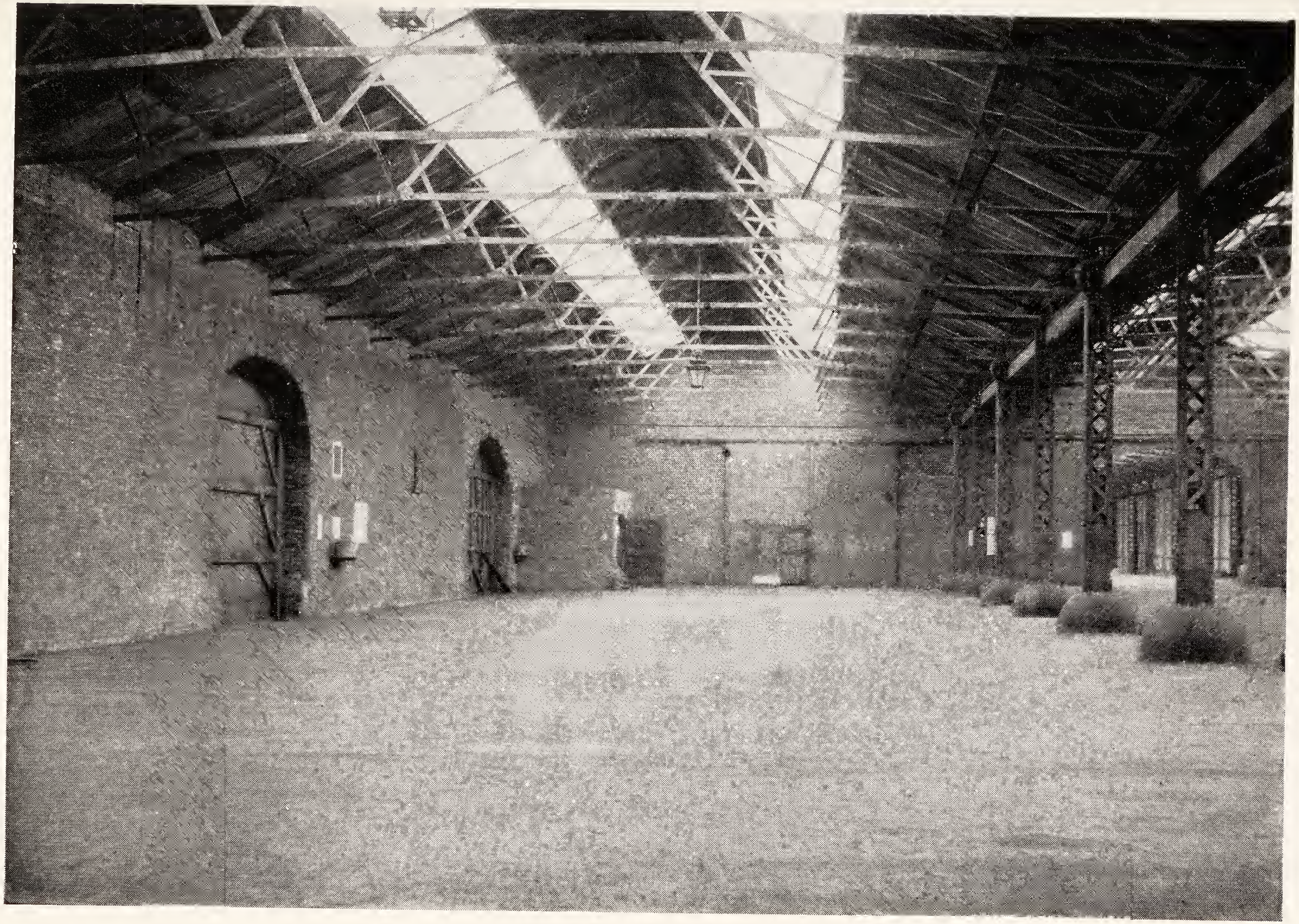
RAT CROSSING AN OLD TYPE OF RAT-GUARD.



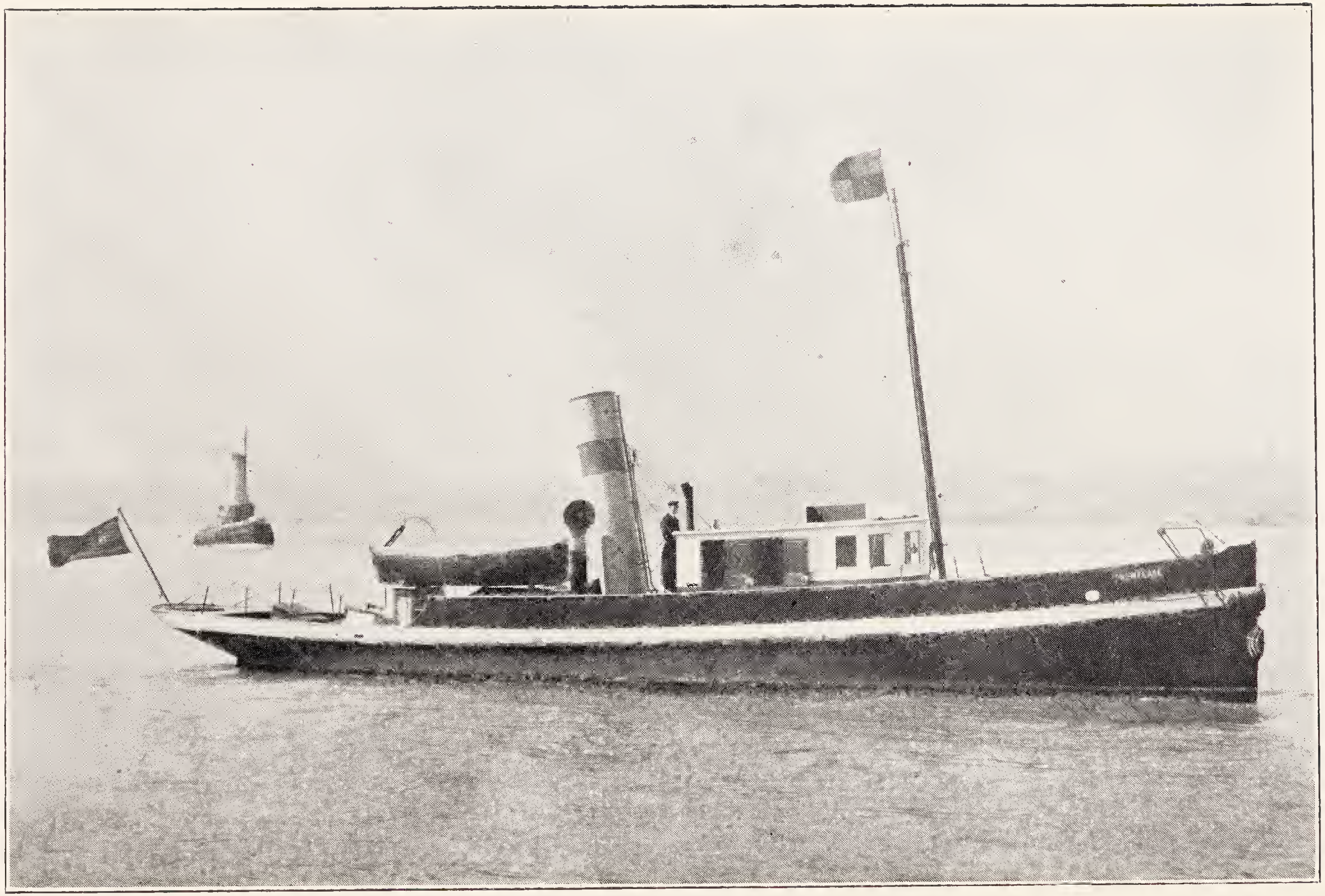
AN IMPROVED TYPE OF RAT-GUARD.—A RAT UNABLE TO CROSS.



AN UNUSUAL CONDITION SHOWING HOW ACCUMULATIONS OF SHIPS STORES AFFORD SHELTER FOR RATS IN AN OTHERWISE RAT-PROOF SHED.



A RAT-PROOF DOCK SHED.



PORT SANITARY AUTHORITY'S STEAM LAUNCH "SNOWFLAKE." (See page 15).